MARINE REVIEW.

VOL. XVI. CLEVELAND, O., SEPTEMBER 30, 1897. No. 14.

More Contracts for Ships.

It is more than probable that before the Review reaches its readers a contract will have been closed, in the office of Pickands, Mather & Co., Cleveland, for a steel tow barge, and the American Steel Barge Co. will have decided to build on its own account a steel barge of the ordinary type. These two boats will bring the number of new steel ships in all lake yards up to about twelve, including the side-wheel passenger steamer for the Cleveland & Buffalo company and the two revenue cutters at the Globe yard. Following is the list: Cleveland Ship Building Co., two 400-foot steamers, one of which is for A. B. Wolvin of Duluth and the other for the Cleveland-Cliffs Iron Co.; Chicago Ship Building Co., two steel tow barges of the largest type, one for James Corrigan of Cleveland and the other for C. W. Elphicke and others of Chicago; Globe Iron Works Co. of Cleveland, two revenue cutters of the first-class for the United States government and a steel tow barge of largest type for estate of Wm. S. Mack, W. H. Becker and others of Cleveland; Union Dry Dock Co., Buffalo, a steel package freight steamer for Union Transit Co.; Detroit Dry Dock Co., side-wheel passenger steamer to cost $375,000, for Cleveland & Buffalo Transit Co. F. W. Wheeler & Co., also operating a steel yard, are now working on two large ocean going tugs for New Orleans, and are figuring with three or four parties for freight vessels.

In figuring with Mr. Wm. G. Mather, president of the Cleveland-Cliffs Iron Co., on the new steamer for which a contract was let, a few days ago, to the Cleveland Ship Building Co., Mr. F. W. Wheeler of West Bay City presented plans for a ship 500 feet long, 50 feet beam and 28 feet hold. This is an indication of what may be expected very soon in the way of larger vessels for the lakes. The contract between the Cleveland-Cliffs company and the Cleveland Ship Building Co. provides for a vessel of 406 feet keel, 50 feet beam and 28 feet hold. Engines will be of the quadruple expansion type.

It is understood that the Detroit Dry Dock Co. has agreed to deliver the new Cleveland & Buffalo line steamer about June 15 of next year. They hope to have the vessel in Cleveland on June 1, but would not fix that date in their agreement with Manager Newman.

Another Amalgamation of Ore and Furnace Interests.

Although there is no doubt now of the completion of negotiations whereby the Carnegie-Oliver interests of Pittsburg have acquired a lease of the Tilden mine from John D. Rockefeller, and control of a majority of the stock of the Metropolitan Iron & Land Co., which owns the Norrie group of mines on the Gogebic range, the principals in the deal, who have been in Cleveland within the past few days, refuse as yet to make an official announcement of the transaction. The Carnegie Steel Co. is now in control of mining properties that will practically furnish enough ore of all kinds to meet its very large requirements. This deal may prompt the building of more ships by John D. Rockefeller, whose relations with the Carnegie company have to do largely with transportation of the ore, but it can not be learned that his representatives have as yet entered into any negotiations for ships for next year.

New Organization for Toledo Line.

As a result of the order just placed with the Detroit Dry Dock Co. by the Cleveland & Buffalo Transit Co. for a new passenger steamer, announcement will undoubtedly be made soon of the organization of another steamboat company to operate the three side-wheel steamers—State of New York, State of Ohio and City of the Straits—that will be placed next season on the Cleveland, Toledo and island route. The new corporation will, of course, be controlled by the managers of the Detroit & Cleveland and the Cleveland & Buffalo lines. The Cleveland & Buffalo company will turn over its two old steamers—State of New York and State of Ohio—to the new company, while the Detroit & Cleveland company puts in the City of the Straits and its dock property at Put-in-Bay, together with a money consideration sufficient to make its interest equal to the value of the two boats placed in the new line by the C. & B. company. These three steamers will admit of daily service to the islands and between Cleveland and Toledo without crowding the boats. The plans of the new line also contemplate a daily service to Sandusky and Lorain.

The new Cleveland & Buffalo steamer will be 16 feet longer than the City of Buffalo and will also have a few feet additional in depth and breadth. Engines will be practically the same as those of the City of Buffalo, but the boiler power will be increased a little. The City of Buffalo is said to have cost about $345,000. She was a very cheap boat, however, and it is probable that close to $375,000 will be paid for the new steamer.

Steamboat Inspection Service.

It is not surprising that the annual report of the supervising inspector general of steam vessels, just submitted to the secretary of the treasury, should show a heavy gain in tonnage inspected on the lakes. The Cleveland local district has for some time past stood next to New York, the most important district in the country, in the amount of tonnage inspected, and Buffalo is third in the list of districts throughout the country. The annual report of the service for the fiscal year ending June 30, 1897, shows that on the lakes 2,249 inspections of steam vessels were made throughout the year, the net tonnage of the vessels being 801,752. During the year ending June 30, 1896, the number of inspections was 2,227 and the tonnage 739,120. The number of officers licensed on the lakes was 9,624, as against 9,046 in 1896. According to some method not fully explained in reports of this bureau, it is figured that this year the loss of life on steam vessels throughout the country was one in 1,800,000 passengers, as against one in 50,000 passengers when the inspection service was first organized.

Broad System of Lighting Lake Channels.

There are on the lakes today, either in position or in the hands of light-house officials, forty-seven gas buoys. A year ago the vessel interests had just begun to realize the value of these lighted buoys, from experience with a couple of them that were first brought to Lake Erie through the enterprise of Col. Anderson of the Canadian marine department. When it is understood that the first cost of each of these buoys to the government, at present prices, is a little more than $1,800, the importance of this summary of one year's additions in the way of new aids to navigation may be realized. But this is not all. There is now in the hands of the light-house board a list of sixty-five points on the lakes where these lighted buoys can be used to advantage, and in the next congress an effort will be made to secure an appropriation of probably $35,000 to provide, next year, for a large number of the shoals and other obstructions not already lighted. Capt. Geo. P. McKay of Cleveland and other officers of the Lake Carriers' Association, who have thus far been very successful in carrying out this system of lighting channels, are not proceeding without the approval of the light-house officials, both at Washington and on the lakes, in all that they are doing. Capt. Schley, chairman of the light-house board, and Commander Wilde, the naval secretary, have both made trips of inspection over the lakes, and from personal contact with the commercial interests involved, returned to Washington satisfied that the broad scheme of using these lighted buoys on a big scale, especially in the connecting rivers and in approaches to harbors, was fully justified. They were impressed also with the lack of power and inadequacy of lights on the lakes, and as chief officers of the light-house institution they may be expected to take steps, during the coming year, to increase the power of a large number of the important lights and to improve the lake system generally.

Not all of the forty-seven lighted buoys referred to above are as yet on their stations. They will be put out early next season, however, and in order to do this the district officers must be afforded additional facilities in the way of new tenders. The first step in this direction will be to provide Commander Folger of Detroit, who is in charge of the large district covering Lakes St. Clair, Huron, Superior and their connecting rivers, with a second vessel. An old tender will very probably be repaired during the winter and turned over to Commander Folger at Detroit in the spring. She will be fitted, alike to the Haze at Buffalo and the Dahlia at Chicago, with a gas compressor for filling the buoys, and then will follow the establishment of a gas manufacturing plant at Sault Ste. Marie, which is the only important point on the lakes where such a plant is not already in operation. This will be done by the Saftey Car Heating & Lighting Co. of New York, the corporation in this country that furnishes the buoys and the gas for their maintenance.

This broad system of lighting lake channels will necessitate also the construction of two new vessels for the light-house service, one for the Chicago district and the other for the Buffalo district. Vessel owners will urge upon congress during the coming winter the necessity of appropriations for these tenders. They will also seek appropriations for at least two light-ships, needed at what are termed exposed points. As an old shipmaster puts it, a light-vessel, after all, "beats a light-house out of sight, as you can run right for it and find it in thick weather; there is then no misjudging of distance, as in the case of a light-house."

Blundering Methods.

Senator Elkins, who has been looked upon as the leading advocate of the discriminating-duty plan of helping American shipping, has made a statement of the part he took in changing section 22 of the tariff act, and he admits some things that will undoubtedly result to the disadvantage of the supporters of this kind of legislation when the shipping question is again before congress. It must be admitted, to say the least, that the overzealous advocates of discriminating duties have greatly injured the vessel interests in their tampering with the tariff bill. The administration, through the recent decision of the attorney general, has "turned them down," and it is right that this has been done, as the vessel interests of the country want no help from hidden methods or tricks of legislation. In effect, the statement of Senator Elkins is that his endeavor to make an effective, discriminating duty provision was thwarted in committee; that after the bill was passed he discovered his object had been gained by indirection and that the law went farther than he had planned, of which he was glad; but who made the changes, and whether the section as it stood was the result of deep design or of fortuitous bungling, he professes to be as yet ignorant. He denies that unusual precautions for concealment were taken, but admits that he "did not proclaim from the capitol steps the intelligence of the efforts he was making to render assistance to American shipping." He practically admits also that he was indifferent as to methods so long as the end was attained, and if, by intention or accident, more was made possible than he had planned as practicable, so much the better. All this is contrary to a fair and upright settlement of the shipping question. It is certain to work to the disadvantage of the scheme of discriminating duties, and the vessel interests have reason to complain of the manner in which they have been misrepresented in this matter.

Commander Folger, inspector of the eleventh light-house district, will very probably announce within a few days, the establishment of two more gas buoys at important points in his district. He is about to place, or has already placed, one of these buoys at the southeast turn (towards Windmill point) of the St. Clair cut, nearly opposite the southerly cluster of piles, which is a very dangerous point, as there are no indications of the width of the channel. The second buoy will be stationed at Detour entrance, Sault river, replacing the black can buoy now at that point.

MARINE REVIEW

Vol. XVI. CLEVELAND, O., SEPT. 30, 1897. No. 14.

35 LAKE STEAMERS (Over 45,000 I. H. P.)

EQUIPPED WITH THE

HOWDEN

BY THE

DRY DOCK ENGINE WORKS,

DETROIT, MICHIGAN.

HOT DRAFT

TOTAL EQUIPMENT IN THE WORLD,

1,383,500 I. H. P.

WHAT IT DOES.

Causes Large Saving in Fuel.

Saves from 10 cts. to 50 cts. per ton in quality of fuel used.

Increases Speed, Carrying Capacity and Earnings.

HOW IT DOES IT.

Maintains an Even Draft.

Furnishes Hot instead of Cold Air to the Furnaces.

Makes all the Steam any kind of Engine can use.

FREE WINTER DOCKAGE FOR STEAMERS WHOSE OWNERS CONTEMPLATE A HOWDEN EQUIPMENT.

THIS Page is reserved by the DRY DOCK ENGINE WORKS, Detroit, Mich., to explain to vessel owners the advantages of the

Howden Hot Draft,

during the next six months.

Device to Supersede the Lead Line.

A dispatch from New York a short time ago referred to an electrical device which, it is expected, will supersede the lead line and do away with the present tedious manner of making soundings when working into port in thick weather. A description of the apparatus is now at hand. The sounding is done by means of a bell circuit, which passes through a carrier, and thence to a non-conducting cylinder filled with quicksilver. When the cylinder strikes bottom a circuit is completed, which rings a bell on board the vessel and gives warning that the vessel is in dangerously shallow water.

The apparatus, to speak more in detail, consists of an air gun, about 2,000 feet of wire, or, rather, of two wires bound around each other, a hollow shell, which will float a cylinder of quicksilver, and an electric battery. The air is forced into the chamber of the air gun by turning a wheel. The cylinder with the wire attached is loaded into the gun. The wire is placed upon a reel, and as much is wound off as the force of the projectile will take with it. The cylinder is hurled through the air for anywhere from 5 to 2,000 feet. The distance depends upon the number of turns the operator has given the wheel by which the air gun is loaded. The cylinder strikes the water and sinks. The length of wire which intervenes between the cylinder and the hollow floating shell, or carrier, represents the depth of water in which it would be safe for the vessel to venture. Most large ocean steamers draw 30 feet. When the wires enter the cylinder contains, will then rush about the ends of the wires, complete and terminate within only a short distance of the surface of the quicksilver. If the water is deep enough, the cylinder will simply hang to the end of the line. If the water is too shallow, however, the cylinder will tumble over on the bottom, for the end of it is rounded. The mercury, which the cylinder contains, will then rush about the ends of the wires, complete a metallic current and cause the ringing of a bell on board ship, with which the wires are connected. The efficacy of the invention depends upon the certainty with which the cylinder will fall over when it strikes the bottom of the channel. As soon as the cylinder sinks the man in charge of the apparatus proceeds to draw in the line. If he hears no warning bell he may be sure that the course is entirely clear. The vessel may then proceed for the distance to which the line has been cast. If 2,000 feet have been sent out the commander may know that his course is clear for that distance. He may then proceed. When the vessel has gone half the course he may discharge another cylinder. When he has reached the end of the course which the first cylinder has told him was safe, he will have determined the nature of the channel for the next 2,000 feet.

A Great German Ship.

The North German Lloyd steamer Kaiser Wilhelm der Grosse and not the Lucania or Campania of the Cunard line is now the largest, most powerful and fastest steamer afloat. Germany has undoubtedly wrested a great prestige from British ship builders. On her first voyage the new German steamer has broken all records between Southampton and New York, making the run between the Needles and Sandy Hook in 5 days, 22 hours and 45 minutes, which is 1 hour and 46 minutes below the mark set by the St. Louis of the American line. Record-breaking runs on initial voyages are not expected. With machinery in improved working condition this steamer will undoubtedly surpass in speed the quickest voyages as well as the greatest daily runs of the big English ships.

The Kaiser Wilhelm was fully described and illustrated in the Review of the 16th inst. With the exception of the Great Eastern and the White Star liner Oceanic, now building at the works of Harland & Wolff, Belfast, she is the largest ship ever built. Her power is greater than that of any steamer ever built. She was built by the Vulcan company of Stettin. A companion vessel, the Kaiser Friedrich, which is 50 feet shorter, building at Dantzig, will be launched Oct. 5. The Kaiser Friedrich is also a vessel of great power, and it is expected she will be very fast. A comparison of tonnage, horse power and dimensions of well-known Atlantic liners built and building is made in the following table:

Vessels.	Tonnage.	Horse Power.	Length.	Beam.	Depth
Oceanic	17,000	.....	704	70	42
Kaiser Wilhelm der Grosse	14,000	28,000	649	66	40
Great Eastern	18,900	8,000	692	82	58
Kaiser Friedrich	12,500	24,000	599	64	38
Lucania and Campania...	12,950	25,000	622	65	43
St. Louis and St. Paul...	11,600	20,000	534	63	43
La Touraine	9,778	13,000	520	56	34
Furst Bismarck	8,250	16,400	500	57	34
City of Rome.....	8,144	11,500	560	52	37
Teutonic	9,984	18,500	556	58	39

The foregoing table is not absolutely correct in all of its figures. It was prepared simply for the purpose of a hurried comparison between the principal Atlantic liners.

Newfoundland holds out the promise of facilities for ocean travel which will enable us to reach Europe by spending only three days on the water. To be sure, the proposed plan would not shorten the journey from Boston or New York to foreign shores, but it would cut down the ocean voyage to a minimum, and that, despite the comforts of a St. Paul or a Campania, is what transatlantic passengers are looking forward to with great eagerness. The project is similar to Austin Corbin's route from Montauk point via the Long Island railway to Ireland. The route is to St. John, N. B.; thence to Sydney, N. S.; thence by a ninety-mile steamer ride to Newfoundland; thence by a 500-mile railroad ride to St. John's, where your steamer will be ready to take you to Cork in three days. It may all be a scheme to boom Newfoundland, and there are a great many drawbacks which would have to be weighed in due season. Pehaps it will be time enough fo us to engage our staterooms when arrangements are made for the subsidy of the steamers.—Boston Journal.

CHICAGO EXCURSION $6.00

Via the Nickel Plate road Oct. 8 on regular trains or by special train leaving Cleveland 6:30 a. m.

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A Leading Corporation of the Lakes.

The Minnesota Iron Co. is a striking example of big corporations that have grown up on the lakes in the past ten or fifteen years. There are, of course, only a few companies or firms whose operations in mines, docks and ships are to be compared with those of the Minnesota company, but the wonderful development of this concern within a very short period is additional proof of a great deal that has been written about the extent of lake commerce. It may be said also that the individual interests of John D. Rockefeller in the Lake Superior mining region and in the transportation of iron ore, acquired practically within the past five years, are now fully equal to those of the Minnesota Iron Co. Affairs of the Minnesota company are made public, as its stock is listed on the New York exchange, and there is no question as to the extent of its operations made known by annual statements.

The capital stock of this corporation, organized only fifteen years ago to develop the Vermillion iron range of Minnesota, is $16,500,000. Its holdings in mining property, now extended to the Mesabi range, covers hundreds of acres. It also owns and operates about 154 miles of standard-gauge railroad; five ore docks, equipped with 743 pockets of a capacity of 120,900 gross tons of iron ore; and nine steel steamers and five barges with a combined capacity for a single trip of about 50,000 tons. The railroad is operated by the Duluth & Iron Range Railroad Co., and the vessels by the Minnesota Steamship Co., both of which are controlled by the parent organization. Its seven mines, representing the developed property, have a producing capacity of 3,000,000 tons annually, and the railroad and docks can handle 3,500,000 tons. The mines will probably produce this year a total approaching 2,500,000 tons.

The number of employees of the company in its mining operation alone is about 2,500 at the present time. It varies from 1,500 to 3,000. In thirteen years which have elapsed since the first shipments from the Vermillion range the original hard-ore mines of this company have produced 5,169,071 gross tons of ore; the Chandler, another of its leading properties, has sent out 3,793,007 tons; and its Mesabi mines, the largest known of which was discovered but five years ago, and which have been shipping but three seasons, have produced 1,842,504 tons, making a total tonnage of 10,804,582 gross tons, or more than 12,000,000 net tons of iron ore handled by a concern only fifteen years of age. Not all of this ore, which represents a very heavy annual output, is moved by the fleet of nine steel steamers and five barges owned by the Minnesota Steamship Co. These vessels are capable of moving probably close to 1,000,000 tons in a season of navigation. The balance of the product is provided for by charter of vessels in which stockholders of the company are interested, and by the engagement of vessels also in the general market.

The five ore shipping docks of the company at Two Harbors, Lake Superior, are fifty-seven to eighty-six miles from the mines. The railway system (Duluth & Iron Range Co.) between mines and shipping docks is standard gauge, with 154 miles of main line and 60 more of side tracks, laid with 80-pound rails. There are fifty-eight locomotives and 2,298 ore cars, besides other equipment of a less-important kind for local traffic. Business of the railway company in 1895 was as follows: Passenger earnings, $69,258.01; freight earnings, $1,488,337.44; mail earnings, $7,318.72; express earnings, $6,000; miscellaneous earnings, $5,453.02; total ($9,592.66 per mile), $1,576,267.19. At the ore shipping docks vessels frequently load and depart with a cargo of 3,500 or 4,000 tons within two hours from the time they reach port. One record has been made of 2,350 tons of ore loaded in 45 minutes. From 15,000 to 40,000 tons of ore are handled daily at Two Harbors.

A Ship Costing Four Millions.

Harland & Wolff of Belfast propose to launch the big White Star liner Oceanic in January next. As the laying of the keel, which is of the solid-bar type, and 18 inches by 3½ inches, but laid on its flat instead of being vertical, as is ordinarily the case, was not begun until February last, the creation of this ship of over 17,000 tons gross measurement and of 704 feet length, will have been accomplished in less than twelve months. Owing to the abnormal length of the Oceanic, the builders had to extend the building berth far beyond and below high-water mark, and this has been accomplished by forming an immense cofferdam of heavy sheet piling around the extreme end of the berth, and inwards along the sides to some considerable distance beyond high-water mark. With the water thus excluded—and with pumps at hand for draining purposes in the event of any leak—work has proceeded on the aft end of the ship at all states of the tide, and at a level considerably below that of the excluded waters.

The White Star management again announces that the Oceanic, although 65 feet longer than any vessel afloat or under construction, will not have triple screws and steam 27 knots an hour as at first reported; she is not to be the startling record-breaker which an interested public would have made her. The aim is simply to give the vessel a sea speed of 21 knots, or one knot in excess of the 20-knot Teutonic and Majestic, of which vessels she is, in fact, to be an enlarged reproduction. In the matter of coal endurance the power of the Oceanic will be most exceptional, a circumstance which would render her of immense value as a transport ship for troops, or as an armed cruiser. In case of need she will be able to steam 23,400 knots at 12 knots per hour, or practically round the world without coaling. The cost of the Oceanic is estimated at $4,000,000.

LOW RATE EXCURSION TO CHICAGO.

On Oct. 8 a special train excursion will be run to Chicago with return limit of tickets good for five days. Tickets will be sold at Cleveland and all stations west at rates lower than have been offered for several years.

Oct. 9 will be the 26th anniversary of the memorable Chicago fire, and the event will be celebrated on Oct. 9, 1897, as only Chicago can celebrate.

In addition to the special train, the cheap excursion tickets will be good within the five days on any one of that trio of express trains which are doing so much to increase the popularity of the favorite Nickel Plate road. Watch the papers for further information on this subject and confer with ticket agents. Oct. 8.

Army and navy charts of the lakes are kept in stock by the Marine Review, Perry-Payne building, Cleveland.

October Weather.

The first of the meteorological charts, to be issued monthly by the United States weather bureau, is at hand. It deals with probabilities as to weather on the lakes during October. Of October storms during twenty years or more past the chart says:

"On the average five storms pass directly over the lake region in October, the majority of which, however, can be safely weathered by the larger craft. Occasionally, an October storm of unusual severity sweeps over the lakes endangering the safety of the strongest vessels. In the last twenty years not more than half a dozen such storms have occurred in the month named. The storm of Oct. 23-24, 1887, was probably one of the most widespread and severe for the season that has occurred within recent years. This storm came from the southwest, passing over the south end of Lake Michigan, across the upper part of the lower peninsula of Michigan to Lake Huron, and thence over Georgian bay. Violent gales, mainly from the southwest and northwest, occurred on the 23d and 24th, accompanied by rain and snow squalls. On Lake Superior the snow was heavy and the gales were from an easterly quarter. The velocity of the wind ranged from thirty-five to sixty-five miles per hour. Other violent October storms occurred in 1880, 1884, 1890 and 1892. The storm of Oct. 28-29, 1892, was notable in several respects. The winds were of such violence that the largest vessels had to seek shelter. The waters of Lake St. Clair and the Detroit river were lowered 2 and 4 feet, respectively, below the normal, doubtless due to the high velocity of the wind, and the fact that it continued at an unusually high velocity for a number of hours. Several of the larger vessels went ashore in Cleveland harbor, and the schooner Glad Tidings was sunk inside the west breakwater by heavy seas breaking over her."

It is said that if the centers of all storms that have passed over the lake region in October during the last twenty years be plotted on a chart it will be found that the general course of progression is easterly or northeasterly. The greatest number of storms pass down Lake Superior from say Grand Marais, Minn., to the Sault, passing over the outer part of the Keweenaw peninsula. The most severe storms are those which approach from the southwest, usually passing over Lakes Michigan and Huron. A number of storms also pass eastward north of Lake Superior, but close enough to influence the weather in the lake region, and many others move up the Ohio valley and out of the United States by way of New England and the St. Lawrence valley. Occasionally West India hurricanes reach the lake region, as in October, 1893, and 1896, but they rarely cause violent winds, except on the lower lakes.

Vessel masters who wish to make a study of the weather should note the position of the storm center on the daily weather maps. Storm centers appearing in the lower or central Mississippi valley are preceded on the lakes by increasing cloudiness, northeasterly, shifting to southeasterly winds, increasing in force as the storm approaches. If the center passes directly over the lake or to the north of the observer the wind will shift to the southwest, and finally to the northwest. The heaviest blow is often with the change to the southwest. If the storm center passes to the south of the observer the wind will back from the northeast around by north to northwest and west, the heaviest blow being at the time of backing to the northwest. In 70 per cent. of the high winds of October the greatest velocity occurs while the wind is southwest, west or northwest.

Information of the kind noted in the foregoing paragraphs is printed on margins of the chart. On the chart itself the prevailing winds for October at weather bureau stations are shown by arrows that fly with the wind. The highest velocity ever recorded and the direction at time of highest velocity are entered for each station. A table of highest velocities for each month of the year at the various stations is given on the back of the chart, where there are also lists of weather bureau stations, notes about wrecks, and general information regarding the weather bureau service. Figures in red on the chart indicate the greatest, the least and the average number of days with fog during October at the various stations on the lakes, as determined by about fifteen years' observations. A day with fog, as used in this connection, means a day on which fog sufficiently dense to obscure objects distant 1,000 feet prevails for at least an hour. These data show simply the relative frequency of fog at the various weather bureau stations.

Mr. Galwey Reverses Another Decision.

The local inspectors of steam vessels at Milwaukee a short time ago suspended the licenses of Capt. Robert Smith of the Whaleback passenger steamer Christopher Columbus and Capt. Stines of the steamer Virginia. The vessels collided (fortunately without much damage) outside of Milwaukee harbor, and after the collision charges were preferred against the captain of the Virginia by the captain of the Columbus. The local inspectors were of the opinion that both officers were at fault and revoked licenses in both cases. It was thought that their decision was prompted in part by the rivalry that has existed between the two vessel masters on account of competition for excursion traffic on Lake Michigan. Capt. Smith took appeal from the decision of the local board, and now John H. Galwey of Detroit, supervising inspector of the district, reverses the decision, declaring in the following letter that the proceeding was irregular:

"In the matter of the appeal taken by Capt. Robert Smith, I am of the opinion, after a careful review of the case, that your action in suspending his license was irregular, for the reason that he was not on trial, but was the complainant in the case against Capt. Stines, and under the rules an officer's license cannot be revoked or suspended without charges being duly preferred, a copy of which must be furnished the officer charged. In the matter of your finding in the case of Capt. Stines, it is my opinion that, as you were investigating charges preferred against him for violation of section 4233 and rules 6 and 26, and you state in your finding that, owing to the conflicting testimony, you are not warranted in arriving at a conclusion as to his guilt, your action in suspending his license is not justified. It is therefore ordered that the suspending of the licenses of Capt. Smith and Capt. Stines be declared null and void."

$6.00 EXCURSION TO CHICAGO

Via the Nickel Plate road Oct. 8 on regular trains or by special train leaving Cleveland at 6:30 a. m., or on regular trains. Ask agents. 346

Success of Pewabic Wrecking Expedition.

Although the Milwaukee wrecking company that has been at work during the summer lifting copper from the steamer Pewabic, sunk in Lake Huron near Alpena, will probably suffer a loss on account of their inability to recover all of the copper from the wreck, they have demonstrated the value of the Smith diving bell for deep-water purposes. In recovering some fifty tons of copper from a depth of 160 feet it has been proven that this apparatus is suited to wrecking work that can not be performed by divers equipped with the modern dress that is generally used in operations of this kind. The expedition has left the wreck of the Pewabic for the season, but the apparatus which they used will undoubtedly be heard of in other operations next season. It will be used to search for more copper in and around the Pewabic, if some wrecking work of a more important kind is not undertaken. It is thought that a large part of the copper on the Pewabic—there was about 200 tons of it—slid through the shattered bow of the vessel as she went down head foremost, and is now below the wreck. None can now be found in the hold. This is the reason given by the wreckers for recovering only a part of the metal. If such is the case it will be necessary, of course, to blow up the wreck in order to get at the balance of the lost cargo. Mr. J. S. Gadsden, Chicago agent of the Aetna Insurance Co., gives an interesting account of a trip below the surface of Lake Huron in the Smith diving bell. His company was interested in the loss of the Pewabic to the extent of $61,000.

"When we went down," says Mr. Gadsden, "the bell was lowered from the wrecking barge over the sunken steamer by a derrick to near the water level, and three of us entered from the top; air was pumped in and the cover put on and sealed. Then we descended. For 20 feet or so from the surface of the water there was a slight leak at the edges of the cover, but as we got down deeper the overhead pressure was so great that it was sealed tight, and not a drop came through. We were in telephonic communication with the surface all the time, and the bell was lighted by electricity. We were lowered first on one side of the steamer, which we inspected. It was a hazy day, and rather dark; still at that depth we could see the heads of the bolts that held the gunwale of the steamer in place at a distance of 6 or 7 feet. Then we were lifted and moved over to the other side of the vessel. Through the glass in the bottom and sides we could see below us and on every side through the water. Several fine specimens of lake trout went swimming by, some of them almost touching the glass. The bell has four legs on the outside, worked by cogs and cranks from the inside, for balancing it on the bottom, where there is a sloping surface. There is also a little propeller for moving it around to any desired position, also worked from the inside. An ingenious feature is two steel rods, working in ball-bearing joints or journals, which pass through the bottom of the bell, and at their ends are grappling hooks for handling the wreckage. A piece of rock was lowered from the surface, and it was pushed into a position where it would hold the cable to which it was attached. Then a piece of dynamite was lowered and was placed in position in the same way. An electric wire was attached to it, and we told them to lift us up. When the dynamite was exploded the surface of the lake was greatly agitated, and large numbers of lake trout were killed by the shock, and soon were seen floating on the water. The men on the barge were so eager in gathering in the trout with nets that they neglected to lower us to see the big bubbles made at the bottom."

Early Use of Water-tight Bulkheads.

The division of a hull of a vessel into compartments is of a more distant period than is generally supposed. As early as the beginning of the nineteenth century the Chinese divided the holds of their trading vessels, intended for distant waters, into a number of smaller holds or spaces. Those compartments were separated by partitions, or bulkheads, made of 3-inch plank, and caulked with a gum that was mixed with lime and threads of bamboo—a composition that readily hardened when brought into contact with water. The number of compartments depended upon the numbers of owners in the vessel. In a large vessel there were sometimes as many as one hundred, each partner shipping his goods in his own berth, which he fitted up to suit himself, and either went in person or sent one of his family to take charge of his property. At just what time this division of the hull was first adopted does not appear to have been recorded. It may have been very old at the period named. The compartments, it will be seen, were made for commercial economy, rather than for the safety of the vessel.

Use of bulkheads for safety purposes was probably first made in the western rivers of the United States. As early as 1820, not ten years after the introduction of steam navigation on the Mississippi and Ohio rivers by Robert Fulton, the hull of the steamboat Columbus, running between New Orleans and Shippingport, Ky., was torn open by a snag, but the vessel was "saved from sinking by having a snag room, which apartment alone was filled with water." The Caledonia, running on the Mississippi river in 1824, also had a snag room. Prior to the year 1849, of 736 vessels lost from all causes on the western American rivers, 419 were lost from snags and other obstructions in the rivers. No doubt the danger in navigating these rivers is what brought the snag room or chamber into use, though if they were as rudely and cheaply constructed as many of these vessels themselves were at this early period, they could hardly be relied on in many cases, and this may account for the fact that they did not come into more general use.—Cassier's Magazine.

Howden Hot Draft for the Coast.

The success attained by the Dry Dock Engine Works, Detroit, Mich., in fitting lake steamers with the Howden hot draft apparatus has led the inventor to extend to this company the right to equip steamers on the Atlantic coast. The advantages of this draft on coast steamers are even greater than on vessels of the lakes, as in most cases fuel is more expensive on the coast, and the great feature of the Howden draft is the reduction in coal bills effected by its use. Coast ship builders will find it profitable to correspond with the Detroit company concerning this economical device.

Opposition of Engineers to Civil Service Rules.

In some parts of the country, the army engineers in charge of river and harbor improvements, fortification works, etc., have raised strong objection to the application of civil service rules to the great number of assistants under their direction. The subject is not new. It has been under consideration in the war department for more than a year past, but little of the correspondence has found its way into the newspapers. A letter covering quite fully the ground taken by the engineers who are opposed to the civl service regulations was written by Major Thomas H. Hamby of St. Louis shortly after the regulations went into effect. It was addressed to the chief of engineers, and as it makes very interesting reading it is here reproduced in full:

"I am greatly distressed and unsettled in my mind as to how I am to carry out the requirements of circular No. 8, June 29, 1896, from your office, and at the same time conduct the works in my charge to which it is to apply in a manner economical and advantageous to the government. Under the new conditions which it imposes, restricting the latitude heretofore allowed the officer in charge of a work and the subordinates under him regarding the selection of the men to carry out the duties enjoined upon each of them, I am at a loss to know where the responsibility for the proper conduct of the work and disbursement of the funds appropriated for its execution is henceforth to rest. Heretofore there have been no grounds for misapprehension upon this point.

"During the ninety odd years that have elapsed since the organization of the Engineer corps its officers have been charged with a multiplicity of public duties, and with the disbursement of almost fabulous sums of money. They have expended and disbursed upon plans and projects prepared by themselves and under their directions, in works of military defense, river and harbor improvements, and other objects for which congress has made appropriations, over $300,000,000. In the expenditure of this sum and in carrying on the works for which it was appropriated there has been no question at any time as to who was responsible for any part of either the work or the funds. The officer or agent charged with the execution of the work was permitted to employ and control the individuals necessary for the purpose, and was held responsible for their actions. He was likewise permitted to select the persons to whom was necessarily intrusted from time to time, for the payment of labor, purchase of materials, and the many other objects connected with the work, large amounts of the public money for which he was responsible. Under the system and methods early adopted and which have been enlarged and perfected during these years, these works have been carried on without friction, or conflict of authority, or question of responsibility; and the funds have been honestly and economically disbursed, without defalcation or scandal of any kind. A practical system of service has grown up in the engineer department which embodies all the good results to be obtained from civil-service enactments, while containing none of the evils and inconveniences which these impose upon public business. As results show, this system, for efficiency and economy in the transaction of the particular kind of government business to which it has been applied, may challenge comparison with any other to be found in the civilized world. It is only in a few instances, within recent years, where the privilege accorded to officers in charge of works of selecting their own men to carry them on, which is the basis of this system, has been interfered with by higher authority, that any question of fixing responsibility for results could possibly be raised.

"Now that the provisions of the circular above mentioned, and the civil-service rules which the president in his wisdom has seen fit to require shall be applied to the operations of the engineer department at large, are to take the place of this system, and the officer is no longer to have choice or say, or at least very limited, as to who shall occupy important positions upon the works in his charge, execute his orders, and supply him with data and information on which depends the accuracy of reports that go to congress and important projects involving the expenditure of large amounts of money, but this important function is to be left to a body of men whose occupation and habits of life are entirely foreign to this class of public business, the question of fixing the responsibility for results comes at once to the front and should be authoritatively settled at the earliest practicable moment. It is respectfully submitted that the conditions which prevailed in other departments of the government for many years prior to the passage of the civil-service act, and which made this law a necessity to good service in those departments, did not pertain in the engineer department; and, furthermore, the conditions under which the operations and public business of that department must necessarily be carried on to insure expeditious work and economical expenditure of the funds appropriated are such that rules and regulations such as are contemplated by that act and based upon it cannot be made to apply without an entire abrogation of the present system and a manifest detriment to the government interests involved. In carrying on the operations directed from this office during the last fiscal year, over $1,100,000 were expended by my predecessor and myself. For this amount, and the execution of that part of the project for the improvements for which it was appropriated, we were responsible; and, from ourselves down to the lowest laborer employed, there was a well-recognized system of accountability and indisputable authority of control. There is available for expenditure during the present fiscal year over $700,000. The amount authorized to be expended during the next four years upon works in charge of this office is $3,400,000.

"Since, under present requirements, I can no longer have the selection of the men who are to execute the work to be done by this large amount of money, and am restricted in my control over those who may be assigned to me for that purpose, and, as I am not permitted to select nor fully control those who must necessarily be employed to assist in handling and disbursing this money, and in the preparation of the accounts and papers pertaining to it, I am naturally desirous of an authoritative opinion, so far as this can be given without recourse to courts, as to how far I am now to be held responsible for the conduct of the work and disbursement of the funds pertaining thereto that are committed to my charge. Whenever it has been clear to my mind that the interests of the service demanded it, I have never hesitated to assume responsibilities in connection with my works, trusting that my action would be approved by those in authority over me. In this instance my judgment is not in accordance with my duty under the requirements of my orders, and I have therefore no desire to do otherwise than to strictly obey the orders, letting the responsibility for results rest with those who issue and interpret them.

"This question is of so great importance not only to engineer officers having charge of government works and intrusted with the disbursement of public money, but to the government also, that it seems proper that it be referred to the honorable the attorney-general for legal opinion. I therefore respectfully request that the foregoing facts be placed before him, and that his opinion be requested as to how far an officer placed in charge of government works and intrusted with the disbursement of the funds appropriated for carrying on the same is to be held responsible for their execution and the disbursements of the funds under the conditions that must prevail when the requirements of this circular are complied with."

Navigation of Duluth-Superior Harbor.

Major Clinton B. Sears, engineer officer-in-charge of the harbor at Duluth and Superior, is anxious that there shall be no misunderstanding among vessel masters regarding the rules and regulations for this harbor, which were formulated with the approval of the secretary of war and which went into effect on the 1st inst. These rules, which are in accordance with authority conferred upon the secretary of war by river and harbor act of August 18, 1894, are as follows:

1. No vessels shall be moored to any entry pier.
2. No material of any kind shall be unloaded onto or loaded from the entry piers, except for the use of the United States, unless by special permission of the engineer officer-in-charge in each case.
3. Vessels shall not anchor in the entrance canals, or in any of the navigable channels, except in the harbor basins, and then only where not in the way of passing vessels.
4. Vessels and rafts shall not be anchored or otherwise fastened where they will be liable to swing into the channels by reason of a wind or current.
5. Vessels and rafts shall take great care not to run into, strike, rub against or otherwise injure the entrance piers, buoys or beacons in the harbor.
6. While dredging operations and the rebuilding of the piers are going on, all vessels will slow down to six miles an hour, while passing said piers, or the dredges, upon being requested to do so by the display or waving of a red flag, or red lantern.
7. Dredges and attending scows and tugs are expected and required to give half the channel for passing vessels and rafts, and the latter are required to do the same when passing the dredges or other craft.
8. The signal for opening the draws of all bridges will be three long blasts of the whistle, or horn where the vessel is not navigated by steam power, and will be given in ample time when approaching the bridge. The only exception to this is when a vessel going into St. Louis bay from Superior bay intends to pass through the Wisconsin draw of the Northern Pacific bridge; it will then add one short blast after the three long blasts.
9. Upon such signal being given, the keeper of the drawbridge, which is signalled, will open it promptly and fully, and will give all vessels right of way over all trains, cars, wagons, foot passengers, etc.
10. Where there are two or more channels leading to a given point, in one of which improvement work is going on, it may be temporarily closed to navigation by the engineer officer-in-charge, after due notice.
11. All rafts shall enter or leave the harbor by the Wisconsin entrance, and no rafts will be permitted to use the Duluth canal.
12. All rafts in passing the bridges will use the rafting spans, and will not be permitted to go through the draw span openings.
13. Rafts at all times will be handled by sufficient number of tugs to enable them to avoid obstructing the channels, and to give half the channel to passing vessels, or in passing dredges.

Stock of Grain at Lake Ports.

The following table, prepared from reports of the Chicago board of trade, shows the stocks of wheat and corn in store in regular elevators at the principal points of accumulation on the lakes, Sept. 25, 1897:

	Wheat, bushels.	Corn, bushels.
Chicago	3,180,000	18,269,000
Duluth	2,040,000	267,000
Milwaukee	102,000	330,000
Detroit	277,000	20,000
Toledo	313,000	496,000
Buffalo	1,377,000	1,332,000
	7,289,000	20,714,000

As compared with a week ago, the above figures show, at the several points named, an increase of 1,979,000 bushels of wheat and 579,000 bushels of corn. On the same date there was afloat on the lakes 3,391,000 bushels of wheat, 2,965,000 bushels of corn and 1,701,000 bushels of oats. Grain afloat on the canals aggregated 224,000 bushels of wheat, 834,000 bushels of corn and 10,000 bushels of oats.

Although an officer of the navy recently reported that the old gunboat Yantic, which the department offered to the Michigan naval reserve, was a few feet longer than any vessel that has as yet passed through the St. Lawrence canals, officials of the Michigan organization are confident that they can, by cutting away the bow of the vessel and making a few other changes, manage to move her through the smallest of the canal locks. It has been therefore agreed, according to the latest dispatch from Washington, that the navy department will, as soon as possible, deliver the vessel at Montreal, with the understanding that the Michigan representatives will provide funds for the transfer through the canals and lakes to Detroit. The Yantic is now at Boston preparing for the voyage, and the work will be hurried in order that she may reach Detroit early in November. F. W. Wheeler & Co. will make such changes in the vessel as will be required in moving her through the canals.

The characteristic of the light at Passage island station, northerly part of Lake Superior, has been changed from fixed red to flashing white every 10 seconds.

Diamond Shoal Light-Ship.

Difference of opinion is again expressed regarding the possibility of keeping a light-ship in position to mark Diamond shoal, Cape Hatteras, where unsuccessful attempts have been made to build a light-house. The announcement that a light-ship, built specially for this shoal, will soon be ready to take its station is the cause of discussion. The new light-vessel will show two powerful electric mast-head lights and be provided with a fog signal that can be heard twelve miles in the heaviest weather. The light-house board itself is divided in opinion as to the feasibility of maintaining a light-ship at the location mentioned, but a majority of the members decided to try the experiment. Capt. Robley Evans, U. S. N., still favors building a great light-house on the shoal, and in this opinion he is supported by the army officers. Capt. Evans thinks that no vessel moored at Diamond shoal could stand the terrible poundings which she will receive. He says: "There is no chain that can be forged that will hold this light on Diamond shoal for any length of time. There is a current at this shoal which sends the sands shifting around at a terrific rate and in a short time will cut any chain, or weaken it so that the first heavy gale will cause it to part. When that happens the light-ship will almost certainly drift ashore and the sixteen men on her will be lost. I have seen a buoy chain on that shoal worn as bright as nickel, and so thin that you could part it with a slight blow. In my opinion this experiment of the government will prove costly."

Capt. Wilde, naval secretary of the board, thinks that a light-ship can weather the gales off Hatteras, and is confident that the new ship will prove a success. She will be the most powerful vessel ever built for such service, and will be anchored fifteen miles from Hatteras light, in 30 fathoms of water. She will show simultaneously, from three lens-lanterns encircling each mast-head, a fixed white lamp for twelve seconds duration, followed by an eclipse of three seconds. Each lantern will have a 100 candle-power incandescent lamp. The lights will be 57 feet above water, and in clear weather should be visible at a distance of thirteen miles. In case of accident to the electric lights, fixed white lights will burn without eclipse. The vessel will be called No. 69, and has a flush deck, two masts, smoke pipe, and fog signal between the masts.

Around the Lakes.

James Davidson's new wooden steamer Bermuda will be ready to go into commission in a few days.

Thomas Monson, senior member of the firm of Monson & Sons, wholesale fish dealers, died at his home in Cleveland, Sunday. He was seventy-six years of age.

A note from Sandusky conveys the statement that Chicago parties have completed arrangements for the erection on the Baltimore & Ohio company's property there of a 1,000,000 bushel grain elevator.

Capt. Q. Gilmore, who was for some time employed in superintending river and harbor work under the direction of Col. Smith, United States engineer at Cleveland, died at his home in Lorain on Thursday last.

It is understood that T. J. Corns, Capt. W. E. Comer and others who purchased the passenger steamer State of Michigan from the Grummond estate of Detroit, paid $10,000 for her and not $20,000 as reported. The vessel will be operated next season on the shore route between Toledo and Alpena.

A lease of the Dawson dock property at Sault Ste. Marie, which was acquired some time ago by the Inter-Ocean Coal & Coke Co. of Cleveland, has passed into the hands of the Port Royal Coal & Coke Co. and the Brier Hill Iron & Coal Co. of Youngstown, O. A dispatch from the Sault says the property will be put in shape for forwarding and steamboat fueling business.

On Monday, Oct. 4, the Carnegie coal and ore railway from Conneaut to Pittsburg—Pittsburg Bessemer & Lake Erie Co.—will be formally declared open for general business, but the road is not as yet in condition to handle the ore traffic. It is expected, however, that by Oct. 15 ore hauling will begin from Conneaut harbor to the Edgar Thomson works at Bessemer, a distance of 145 miles.

New York parties have taken options from W. H. Cook of Chicago on the steamers Westover and Roanoke, two lake vessels which it is proposed to send to Alaska next spring. If the sales are made the boats will probably be delivered in New York this fall. The Westover and Roanoke were originally salt water craft, having been built at Wilmington, Del., in 1873. Very slight changes in the machinery are required to make them fit to double Capt Horn.

A dispatch from Houghton says: The dredging above Princess point has been completed and there is now 20 feet of water right up to the west bank. The dredging at the upper canal is progressing rapidly and there will soon be an 18½-foot channel 70 feet wide, which will allow any vessel of the lakes to pass through Portage waterways fully laden. The work on Portage entry channel is not progressing so rapidly, owing to the full depth of 21 feet being dug out instead of 18 feet as was originally contemplated.

"I see the newspapers say that the manila hawser used to tow the new Spanish dry-dock across the Atlantic from England to Havana is the biggest ever made," said an old salt in the Brooklyn navy yard, a few days ago. "I know of two that were bigger. This hawser is only 22 inches in circumference, while the two that we have had right here in the yard were 23 and 24 inches in circumference. They were made on the rope walk outside of Brooklyn. The 24-inch hawser was used as sheet anchor cable aboard the old Tennessee, when she was on the Mediterranean station in the '60s. She was in the Bay of Naples when a furious storm came up. The officers ordered the crew to get the sheet anchor out o' the waist. They finally did so, but the big hawser was so unwieldy to handle in such an emergency that when the Tennessee got back to the Brooklyn navy yard the hawser was sent to the oakum mill and made into oakum. The 23-inch hawser was used in anchoring the old receiving ship North Carolina in the stream at the Brooklyn navy yard. Both were made by hand, and were so big that they could not be carried in the usual way by ox teams. They had to be dragged down to the navy yard by the rope walk men."—New York Sun.

Big Scheme of New Dry Docks.

Acting Secretary Roosevelt of the navy makes public the report of the board appointed some time ago to consider the needs of the navy in the matter of new dry docks. The board finds that five new docks, to cost $5,775,000, are urgently necessary, while one—the Port Royal (S. C.) dock—should be enlarged immediately. Four of the docks, the board says, should be of concrete, namely, at Boston, New York, Norfolk and at Mare island, this last to be 500 feet long. At Algiers, near New Orleans (with Galveston or Pensacola as alternatives), it is proposed to place a steel floating dock and wharf. This would cost $750,000. In addition to these the board recommends (not in the urgent list, however) docks to cost $5,300,000 at New London, Newport News, Tortugas, San Francisco (concrete dock on Yerba Buena island, 700 feet long, $1,500,000), San Pedro (concrete dock, 700 feet long, $1,500,000). This work seems very extensive, but the board says that with all the additions it proposes to the number of our dry docks we still would have for naval purposes on our entire coast line only one more dry dock than has Great Britain at one of its navy yards, Portsmouth, England. At present the United States has a total of eleven dry docks, only one of which at this time (that at Puget sound, Washington) can take in our battleships.

The department will very probably endorse the report of the board regarding the first list of docks required immediately, with the exception of that part relating to a new dock at Mare island. Unless there is assurance of more battleships being built for the Pacific coast, it would not be advisable to build a second dock at Mare island.

Channel at Amherstburg.

Captains of the steamers America, Stevens and several other vessels recently reported striking in the channel near Amherstburg (vicinity of New York shoal), Detroit river. Col. Lydecker ordered the engineer in charge of work at this point on the river to search for the obstructions, and it seems that they have been removed. Capt. Andrew Hackett, of Bois Blanc island, who keeps the vessel men informed of matters pertaining to the navigation of the river, says in a letter to Capt. Geo. P. McKay of Cleveland:

"Four boulders, one of them very large, were removed from the vicinity of New York shoal a few days ago. The large boulder is very probably the one on which the America struck, as it was worn off smooth and there were pieces of oak in the crevices. Vessels bound down the river should pass on the island side of the channel, as there is better water on that side. A black stake should be stationed opposite the red one on New York shoal. On one of the days of low water last week, the steamer Waldo, drawing 17 feet, passed down on the island side of the channel without difficulty."

A few days ago, the captain of the steamer Sir William Siemens reported that his vessel struck abreast of the black stake at the north end of Bois Blanc island, which is also in the vicinity of Amherstburg. The matter was taken up by Geo. L. McCurdy of Chicago and the attention of the engineers called to it. Early in the spring, when this stake was placed in position, there were no obstructions to the east of it, but the stake may have been moved since, and the locality will therefore be examined for obstructions. Many obstructions are being removed as a result of these reports from the vessel masters.

Trying to Help the Coal Producers.

A circular recently issued by G. M. Beach, general superintendent of the Pittsburgh & Lake Erie Railroad Co., will indicate the importance attached to the car question by managers of roads carrying soft coal to lake ports. Mr. Beach says:

"The conditions of the lake coal trade are of such a nature that it will be necessary for the railroad companies to have the use of every available coal car, in order to enable coal shippers to complete their contracts before the close of navigation, and with this end in view, it is earnestly requested that the shippers of all other material shall, as far as practicable and consistent with their business, restrict the use of coal cars for material other than coal during the period named, and that both agents and shippers will assist us by using every endeavor to promptly release all coal cars which may be received under load. Agents will report to the superintendent all cases, giving full particulars, where coal cars are not unloaded within forty-eight hours, with the exception of cars loaded with iron ore and limestone."

To Arm Auxiliary Ships.

Washington dispatches credit President McKinley with an intention to urge upon congress a material increase in the number of battleships and torpedo boats, and it is also understood that the president will recommend a liberal appropriation for the armament of our auxiliary fleet of cruisers, amounting in number to twenty-eight. Included in this division of our naval establishment are several splendid first raters, like the ocean liners, St. Louis, St. Paul, Paris and New York. The heaviest of these ships are the Paris and New York. When in government commission, each will be armed with twelve 6-inch guns, six six-pounders, and six machine guns. The estimate of the bureau of ordnance is that it will take to arm the auxiliary vessels thus far inspected and classified, forty-six 6-inch, twenty-seven 5-inch, and 104 4-inch rapid-fire guns; fifty-four 6-pounders and eight 1-pounder rapid-fire guns; and 112 machine guns. To push the armament of this branch of the service, it is believed that the congress will be asked to appropriate $500,000 for the next year, and an equal amount annually until the task is completed.

Luce's "Seamanship" has been a text-book at the United States naval academy for the past thirty years. It is being used by naval reserve organizations all over the country. It is a standard work, selling at $10, and will be mailed to any address at that figure by the Marine Review, 409 Perry-Payne building, Cleveland.

The Review has excellent photographs of lake ships.

MARINE REVIEW

DEVOTED TO LAKE MARINE AND KINDRED INTERESTS.

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The books of the United States treasury department on June 30, 1896, contained the names of 3,333 vessels, of 1,324,067.58 gross tons register in the lake trade. The number of steam vessels of 1,000 gross tons, and over that amount, on the lakes on June 30, 1896, was 383 and their aggregate gross tonnage 711,034.28; the number of vessels of this class owned in all other parts of the country on the same date was 315 and their tonnage 685,204.55, so that more than half of the best steamships in all the United States are owned on the lakes. The classification of the entire lake fleet on June 30, 1896, was as follows:

	Number.	Gross Tonnage.
Steam vessels	1,792	924,630.51
Sailing vessels and barges	1,125	354,327.60
Canal boats	416	45,109.47
Total	3,333	1,324,067.58

The gross registered tonnage of the vessels built on the lakes during the past six years, according to the reports of the United States commissioner of navigation, is as follows:

Year ending June 30.	1891	204	111,856 45
" " "	1892	169	45,968.98
" " "	1893	175	99,271.24
" " "	1894	106	41,984.61
" " "	1895	93	36,352.70
" " "	1896	117	108,782.38
Total		864	444.216.36

ST. MARY'S FALLS AND SUEZ CANAL TRAFFIC. (*From Official Reports of Canal Officers.*)

	St.Mary's Falls Canals.			Suez Canal.		
	1896*	1895*	1894	1896	1895	1894
Number of vessel passages	18,615	17,956	14,491	3,409	3,434	3,352
Tonnage, net registered	17,249,418	16,806,781	13,110,366	8,560,284	8,448,383	8,039,175
Days of navigation	232	231	234	365	365	365

*1895 and 1896 figures include traffic of Canadian canal at Sault Ste. Marie.

The position of the marine interests of Chicago with reference to the removal or lowering of tunnels under the river is a peculiar one. The city, as well as the vessel owners, is waiting for the government to act through the war department on the tunnel question. Contrary to the attitude of the government towards all other ports, congress has appropriated a large sum of money for the dredging of Chicago river. The appropriation was greatly in excess of what was needed for dredging, and is to be applied to widening the river. All this is done on the plea that the war department exercises control over the river and must provide for its improvement to meet the demands of commerce. But on the question of lowering the tunnels the Chicago interest met with a new snag with the government. The scheme of improvement of the river recommended by the district engineer of the government provided for only 16 feet draft. When the secretary of war was requested to order a removal of the tunnel crowns on the ground that they were an obstruction to navigation his answer was that he could not do so, as there is 16 feet of water over them and the adopted plans for the river improvement as yet provide for only 16 feet and not 20 feet as proposed. In view of this condition, the Chicago interests must go to Washington again next winter with their scheme of a 20-foot channel before anything can be done with the tunnels through the government. They may be successful, as they are in most things that they undertake, but they will meet with more opposition than in the past. Representatives of other lake ports will not stand by and see Chicago favored with government funds for work that is done by the municipalities in other places. Although it was not generally known, Congressman Burton of Cleveland opposed the appropriation for Chicago river in the last congress. "How can I permit of such an appropriation going through," he said, "when my own city is spending $500,000 on its own account for improvements that are identically the same as those to be made by the government in Chicago." Mr. Burton's opposition was not of a determined kind, on account of the claim that improvement in Chicago would benefit all lake interests, but it is hardly probable that the Chicago interests can go before another congress and ask to be specially favored as against the uniform method applied to all other lake ports.

"I will not admit," said Capt. James Dunham of Chicago, while visiting in Cleveland a few days ago, "that the old line of vessel owners on the lakes can be charged with allowing the ore business and other big lines of trade to slip out of their hands on account of a lack of enterprise on their part. Such is not the case. The lake vessel business did not present opportunities to make money on a great scale. The money that has of late been put into mines, railways, etc., to develop a big transportation business is money that has been made in other lines, where greater opportunities were offered. It is new capital that has sought investment on a scale beyond the possibilities of men who have made the best of their opportunities in the vessel business. This view of the situation applies clearly, I think, to the operations of Mr. Rockefeller and to those of two or three big corporations that were successful in the development of choice iron mining properties. The great change that is coming over the vessel business is a hard blow to a class of industrious business men, and the unfortunate feature of the situation is the fact that they must remain in the business while their property—the older class of vessels—becomes worthless on their hands. They can not get any money out of what they have, and all of them cannot turn attention to other lines, as with most of them, especially the older ones, the management of vessels is the only business with which they are acquainted. It is a hard proposition to ponder over, but the victims can only grin and bear their loss.

If the iron and steel manufacturers of this country, who are trying to build up an export trade, make as much progress in the next two years as has been made in a like period just past by manufatcurers of electrical and other machinery, there will be no excuse for the complaint that has been raised against big combinations in the iron industry. While the big interests are directing attention to a foreign trade, the smaller concerns will find work enough at home. The very large foreign patronage now held by manufacturers of American machinery has been built up almost entirely within the past two or three years. An idea of the extent of this trade may be gained from the following list of foreign orders booked recently by one concern, the E. P. Allis Co. of Milwaukee, Wis.: Six cross compound engines having cylinders 23 and 46 by 48 inches to run ninety-four revolutions and be coupled direct to General Electric generators of 800 kilos, for the London underground railway; five engines coupled direct to 500 kilo. generators, three of which go to Barcelona and two to Madrid; four engines to be coupled direct to 800 kilo. General Electric generators for the government tramways of Sidney, New South Wales, Australia; also one tandem compound with cylinders 22 and 42 by 48 inches for running a stamp mill at Johannesburg, South Africa.

For two weeks past work has come to steel plants and rolling mills all over the country with a rush, and in the case of some of the largest concerns has simply swamped them. It would seem from the undercurrent of excitement in all branches of the iron and steel trades that cool heads will be needed soon to prevent an unduly rapid rise in prices. Pig iron sales are very heavy and the demand for immediate delivery of pig iron of all kinds is probably more urgent than ever before in the history of the trade. The demand for early delivery on orders extending over the balance of the present year, is also supplement in nearly all lines with inquiries and some orders for the early part of 1898. As yet the prices of finished iron and steel have lagged behind. There have not been advances corresponding with the upward movement in raw material. In a number of lines, it is true, values have reached a higher level, and, what is of much promise, the number of sellers at low prices is rapidly shrinking down to a corporal's guard. In the steel rail trade specifications are coming in very freely and there is a decidedly firmer tone. So far as the export trade of pig iron is concerned, the belief is expressed that when the English engineers' strike is out of the way we may witness a rising tendency abroad which will allow a continuanc of selling by us.—Iron Age.

James McMillan, senior senator from Michigan, who has assisted the vessel interests of the lakes in a great many measures that have been taken up in congress within the past three or four years, was born in Canada and was seventeen years of age when he left Hamilton for Detroit. He is one of a great number of successful business men throughout Michigan and other states near Canada who left their native country at an early age to seek fortune among more prosperous neighbors. He began as a clerk in one of the wholesale houses of Detroit but soon entered the employment of the Detroit & Milwaukee railroad, which was the initial step to a very successful railway career. Then followed his interests in the Michigan Car Co., Duluth, South Shore & Atlantic railroad, Detroit & Cleveland Steam Navigation Co., Detroit Dry Dock Co. and other Michigan and Detroit enterprises. He held no very important public offices previous to 1889, when the people of Michigan, satisfied of his business ability and integrity, paid him the great compliment of putting him in the place of Zach Chandler. In the senate Mr. McMillan is not a speaker but is highly successful in important committee work.

For a month or six weeks past the losses on steel vessels due to stranding in the rivers has been very light, and casualties occasioned by stress of weather, fog, etc., have up to this time probably been the lightest ever known on the lakes. Only one total loss, that of the steamer Florida by collision with the Geo. W. Roby on Lake Huron May 20, may be regarded as a heavy loss from an insurance standpoint. The schooner Kent, which foundered on Lake Superior a few days ago, was not insured. Her cargo was insured but was not valued at more than $4,500. These two vessels, aside from two or three small lumber hookers, worth only a few thousand dollars, represent the total losses thus far. The worst part of the season is yet to come, of course, and changes in water at the Lime-Kilns due to winds may result in more strandings at that point, but it is to be hoped that the losses may be kept down to the present limit throughout the fall. Light losses mean lower insurance permiums.

Contrary to what might be expected, vessel owners of the lakes show little interest in the work of the engineer commission that has begun surveys for a ship canal from the lakes to the Atlantic seaboard. Nine out of ten of them generaly dismiss the subject when it is brought up with the remark that the actual building of such a canal is a matter to be considered by a future generation. They know enough of such matters, however, to not waste time reading long newspaper articles of the kind sent out from Albany a few days ago, in which the smallest details of a route for the canal were outlined as the recommendation of a commission that has just begun a system of surveys requiring at least two years for completion.

Ship builders who are planning various types of vessels to be sent to Alaska next spring may profit by studying the geography of the Klondike region. A man standing on the bank of the Yukon 150 miles from its mouth can not see the other bank. The Yukon is twenty miles wide 700 miles from its mouth. With its tributaries it is navigable 2,500 miles. It discharges one-third more water than the Mississippi. The water is fresh fifteen miles from its mouth. Its color is beautifully blue to its junction with the White river, 1,100 miles above its mouth.

Early Steamboat Experiments.

Prior to 1816 steamboats had not been introduced on the great lakes, although it is on record that a steamer called the Dalhousie was built in 1809 at Prescott, Ontario, and was chiefly employed on the St. Lawrence river. It is also a matter of record that during the same year the steamer Accommodation passed down the St. Lawrence, arriving at Quebec from Montreal about Nov. 5. In order to proceed regularly, I will quote from the Quebec Mercury of Nov. 5, 1809: "On Saturday morning at 8 o'clock arrived here from Montreal, being her first trip, the steamboat Accommodation with ten passengers. This is the first vessel of the kind that ever appeared in this harbor. She is continually crowded with visitants. She left Montreal on Wednesday at 2 o'clock, so that her pasage was sixty-six hours. She has at present berths for twenty passengers, which, next year, will be considerably augmented. No wind or tide can stop her. She has 75 feet keel and is 85 feet on deck. The price for a passage up is $9 and $8 down, the vessel supplying provisions. The great advantage attending a vessel so constructed is that a passage may be calculated on to a degree of certainty in point of time, which cannot be the case in any vessel propelled by sails only. The steamboat receives her impulse from an open double-spoked perpendicular wheel on each side, without any circular band or rim. To the end of each double spoke is fixed a square board, which enters the water and by the rotary motion of the wheel acts like a paddle. The wheels are put and kept by steam operating within the vessel. A mast is to be fixed in her for the purpose of using a sail when the wind is favorable, which will occasionally accelerate her headway."

On February 6, 1816, a petition bearing the names of Charles Smith, David Boyd, Eli Lusher, Abraham Van Santvoord, John R. Degraff and their associates, was presented to the New York legislature for the incorporation of an association to be styled the "Ontario Steamboat Company," with a capital of $200,000. A bill was prepared and passed the house by a vote of seventy-six to forty, but did not become a law in consequence of the early adjournment of the legislature. On Aug. 16, 1816, however, a steamboat was commenced at Sackett's Harbor after the model of the Sea Horse, which was then running on the sound near New York. She was 110 feet long, 24 feet wide and 8 feet deep, measuring 237 tons. The boilers are said to have been 17 feet long and 3½ feet in diameter. Her engine was of the beam type with a cylinder 20 inches in diameter and a stroke of 3 feet. With this machinery 20 horse power was developed. The wheels were 11 feet 4 inches across. It is said that when the boilers had been placed in the hold, the engine lined up and connected, and the trial of the boat was near at hand, a two-horse wagon, loaded with the by-product of a livery stable, drove into an alley leading to the dock to which the boat was secured. With discreet celerity, as the shades of night were falling, a transfer of the contents of the wagon was made to the hold of the steamer, where it was evenly distributed within the boilers; after this was done the boilers were closed up and pronounced complete and ready for use. During this time an observant stranger, doubtless a seeker after knowledge, had been lounging about the dock, intently watching the proceeding with a puzzled air. After it was over, and as he stood by himself, he was heard to say: "Gosh! I've heerd a good deal about the hoss power of boilers, but I never knew before how they got at it. I see it now; they reckon it the quantity of hoss manure they put in 'em."

Early in 1817 this steamer, which was called Ontario, was completed, and made her first trip, being everywhere greeted with the most lively demonstrations of joy. Capt. Francis Mallaby, U. S. N., was her first master. Weekly trips from Ogdensburg to Lewiston were first attempted, but on July 1, 1817, the owners advertised that, finding the trip of about 600 miles too extensive to be performed within that time, it would be altered to ten days. The through fare was $15. The Ontario continued to run, seldom exceeding five miles an hour, until 1832, when she was broken up at Oswego. She was the first steamer to navigate water subject to a swell, and therefore determined that interesting problem.

The steamer Frontenac was built at Frontenac (now Kingston), Canada, soon after the Ontario, and commenced plying in 1818. She was 500 tons burden and the first Canadian steamer on the lakes. She had no guards, except at her wheels. She carried three masts, was painted black and presented much the appearance of an ocean steamer, but carried no yards. She was sailed by Capt. McKenzie during her entire existence, which ended in 1828.

Above Niagara Falls, during the winter of 1818, the building of the steamer Walk-in-the-Water was commenced at or near lower Black Rock, on the Niagara river. She left on her first voyage from Black Rock, for Detroit in August of that year and arrived on the 27th, after a passage of five days. Capt. Job Fish, an eastern man, sailed her and she had a passenger list of twenty-nine. Her license and enrollment were dated August 22, 1818. Her second arrival at Detroit was on Sept. 7, with thirty-one passengers, including the Earl of Selkirk and suite, destined for the far northwest. She was the first steamer to visit the waters of Lake Michigan and Green bay, which was in July, 1819. She was then commanded by Capt. Jedediah Rogers. She ended her career on the night of Nov. 1, 1821, Capt. Rogers master, having on board eighteen passengers, besides officers and crew, all of whom were saved. She was 342 tons burden, with low pressure crosshead engine, and a speed of five miles an hour.

On Lake Ontario, following the steamer Ontario, was the Sophia, of 75 tons, built at Sackett's Harbor, Capt. Rhodes being her first commander. Her career was a brief one, and eventually she was broken up. At Kingston, Canada, the steamer Charlotte, of 150 tons burden, was built in 1818. She was the first steamer to ply on the Bay of Quinte, going from Prescott to the head of that bay. The Dalhousie, built in 1819, was the third steamer built on the Canada side of Lake Ontario, at Kingston, by Henry Gildersleeve. She plied on the same route as the steamer Charlotte.

The Martha Ogden was the fourth steamer built on the American side of Lake Ontario. She went into service in 1825, was first sailed by Capt. Daniel Reed, and in 1830 by Capt. James Van Cleve. The Ogden was wrecked in 1832 at Stony point while in command of Capt. William Vaughn. She had left Oswego on the afternoon of Nov. 12, and was soon afterward struck by a heavy gale from the southwest. Being unable to return to Oswego, she was headed for Sackett's Harbor. In the meantime, having sprung a leak, her fires were put out, and sails were resorted to. Unable to double Stony point, both anchors were cast, but eventually the lines parted and she stranded in 10 feet of water. There was on board twenty-two passengers and a crew of six. With much peril a man succeeded in reaching the shore, eight rods distant, where a line was extended from the boat to the land and the whole company on board were safely drawn ashore in a three-bushel basket, rigged upon the line with a Dutch harness. Capt. Vaughn was the last one to leave the wreck, which went to pieces during the day. This vessel was 150 tons burden and was owned by S. & L. Dennison of Sackett's Harbor. The disaster occurred at Nuttings' bay, on the coast of Henderson.

During the year 1816 and the three following seasons, there were plying on the British side of Lake Ontario, among others not necessary to name at this time, between Fort George (now Niagara) and York (now Toronto) the schooners Crazy Jane, Catherine and Asp, transporting freight and passengers. The boats averaged two trips a week. The principal points where steamers and vessels were constructed on the Canada side in early days were Kingston, Toronto, Fort George, Queenston, Prescott and Brockville up to 1828; and on the American side, Sackett's Harbor, Ogdensburg, French Creek and Brownsville, up to 1834.

A. A. P.

Rope Transmission of Power.

The plant of the Milwaukee Dry Dock Co. presents an interesting application of rope transmission of power. The outfit is of the Dodge patent American kind and was installed by the Milwaukee Rice Machine Co. Power is transmitted by means of a single 1-inch rope more than 200 feet from a 100 horse power engine in the blacksmith shop to the saw mill. These shops stand at an angle of about 45 degrees. The engine wheel is 96 inches in diameter, has eight grooves, and transmits power to a sheave with a diameter of 6 feet and grooved for ten wraps of the rope. Two of these grooves are used to drive an auxiliary shaft. One continuous rope transmits power direct to the shaft in the saw mill. This is accomplished by an arrangement of idlers over the main line shaft in the blacksmith shop, no idler sheaves being used in the saw mill except the winding sheave, which is placed beside the driving sheave, running loose on the shaft, so that any slippage (due to differential tension of the rope driven the distance of over 200 feet) is compensated for without friction. Both the rope and the tension carriage are entirely exposed to the weather. This tension carriage, a feature of the American system of rope transmission, automatically takes up the slack rope occasioned by atmospheric changes, or other causes, and keeps up an almost uniform rope tension. The rope is rendered impervious to the weather by applications of a special kind of rope dressing.

This transmission has been in daily operation for nearly two years. Not a minute has been lost on account of any failure of the rope or any of the transmission accessories. The drive travels at a high rate of speed, yet to one looking at the rope in operation it would at first sight appear to be perfectly quiet, so little vibration is noticeable. The power in the plant was formerly transmitted by means of ropes, but by a different system, employing no tension carriage, and the longest life obtained for any rope was six months, while many played out in much less time, and all ropes required constant attention, being spliced and respliced many times ere being discarded. The satisfactory working of this drive is emphasized by the fact that the dry dock company, when adding an extensive plant for the working and shaping of steel for the purpose of building and repairing steel vessels, adopted the American system of rope driving for transmitting power from the engine in this new shop to the main line shaft and also to an auxiliary drive to transmit power from the main line shaft to the minor line shaft on the opposite side of the room. Each of these shafts is over 100 feet long, is 3 7-16 inches in diameter and fitted throughout with Dodge adjustable capillary self oiling pillow blocks.

Draft of Water in Detroit River.

As yet, fluctuations in the draft of water at and in the vicinity of the Lime-Kilns and Ballard's reef are not great, but with strong winds during the balance of the season great care will be necessary in loading so as to get over this shallow portion of the Detroit river. Following is the draft of water for the week ending at noon Tuesday, as reported four times a day by Duff & Gatfield:

	WATER.	WIND.
Sept. 23, 6 a. m	17 ft. 8 in.	N. E., moderate.
" " noon	17 ft. 8½ in.	" moderate.
" " 6 p.m	18 ft.	Calm.
" " midnight	17 ft. 8 in.	Light.
Sept. 24, 6 a. m	17 ft. 8 in.	Calm.
" " noon	17 ft. 7½ in.	S. W., light.
" " 6 p. m	17 ft. 7½ in.	S., light.
" " midnight	17 ft. 8½ in.	S. W., light.
Sept. 25, 6 a. m	17 ft. 8 in.	Calm.
" " noon	17 ft. 7 in.	S., light.
" " 6 p. m	17 ft. 9 in.	S. E., light.
" " midnight	17 ft. 7½ in.	S. E., light.
Sept. 26, 6 a. m	17 ft. 7 in.	W., light.
" " noon	17 ft. 5½ in.	N. W., light.
" " 6 p. m	17 ft. 8½ in.	N. E., light.
" " midnight	17 ft. 9 in.	N. E., light.
Sept. 27, 6 a. m	17 ft. 6 in.	N. E., light.
" " noon	17 ft. 9½ in.	N. E., moderate.
" " 6 p. m	17 ft. 6 in.	N. E., light.
" " midnight	17 ft. 9 in.	Calm.
Sept. 28, 6 a. m	17 ft. 10½ in.	N. E., light.
" " noon	17 ft. 4½ in.	S. W., light.

Take the Nickel Plate $6.00 excursion to Chicago Oct. 8. Choice of regular or special trains. 348

Trade Notes.

The Buffalo Forge Co., Buffalo, N. Y., is equipping with forced draft and heating and ventilating apparatus the large ferry-boat that is being built by the Charles Hillman Ship & Engine Building Co.

Branch houses for the sale of pumping machinery have been opened by Henry R. Worthington at Nos. 713-717 Perdido street, New Orleans, and in the Century building, 317 North Ninth street, St. Louis. A new general catalogue, No. 28, dealing with Worthington pumping engines, steam pumps and hydraulic machinery, has been issued, and may be had upon application to the main office, Brooklyn, N. Y., or at any of the Worthington branch offices, which are established now in all of the principal cities of the country.

M. T. Davidson of Brooklyn, N. Y., manufacturer of the Davidson steam pump and improved hydraulic machinery, has recently purchased all the patents of Geo. W. Baird, chief engineer, U. S. N., for evaporating and distilling apparatus and is now the sole owner and manufacturer of the same. Mr. Baird's inventions have been known for years in vessels of the navy, light-house service and coast survey and in merchant marine steam vessels and yachts. While retaining all the advantageous features of the Baird apparatus, Mr. Davidson has added some improvements of his own, and says he will now guarantee it to be the simplest, most efficient and most easily cleaned, while occupying minimum space and weighing no more than any other apparatus employed for a similar purpose.

A catalogue of 218 pages, revised to Sept. 1, has just been issued by the American Ship Windlass Co., Frank S. Manton, agent, Providence, R. I. The book contains full particulars of all of the specialties of the Providence company—windlasses, capstans, towing machines, etc.—and the illustrations are clear and complete in every particular. This catalogue is especially interesting to vessel men, as it deals with the many improvements and the great saving which this company's machines have conferred upon the shipping community during the past forty years. During all this time the Providence company claims never to have turned out a poor machine. Their customers generally will bear them out in this assertion, and, what is more, their machines have always stood in advance of anything in their line ever made in the world.

New Books.

"Trigonometry," a book intended for young men in the merchant marine, is the latest volume of Charles Griffin & Co.'s popular nautical series, published by the J. B. Lippincott Co., Philadelphia. The simplicity of these little books and their great value, largely on this account, to young men in the merchant marine, has been referred to several times in these columns. The author of "Trigonometry" is Richard C. Buck of the Thames Nautical Training College. The price of the book is $2.

During 1895 and 1896 a series of articles entitled "Valve Gears" was published in "Power," by C. W. MacCord, Jr., M. E. The object of the papers was to put the principles of design of slide-valves in a practical form for practical men. The subject matter of these papers, revised and rearranged, with new cuts, has just been published by John Wiley & Sons of New York. It sells—8 vo., cloth, 168 pages and 101 illustrations—at $2.

Home-seekers' excursions west, northwest and southwest are offered via the Nickel Plate road Sept. 21 and Oct. 5 and 19, at about one fare for the round trip. Inquire of agents. 316-Oct. 18

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Triple-Screw Cruisers.

European countries are all following the lead of the United States in the building of triple-screw cruisers. A vessel of this type which will shortly take the water at Kiel for the Germany navy, will be of 10,650 tons displacement, and will, it is anticipated, attain a speed of 19 knots. She is built entirely of steel, and will have a belt of nickel steel 8 inches thick, and an armored deck of the same material, 3.15 inches at its thickest part. She will carry four 10-inch guns, placed in pairs in fore and aft revolving turrets built of 8-inch nickel steel plates; and will also be fitted with torpedo tubes and some thirty quick-firing guns. This vessel is 394 feet long, 65½ feet beam and will draw 26 feet of water.

Two triple-screw cruisers of the armored class have also been ordered for the French navy. The first of these, the Dupetit Thouars, will be laid down at Toulon, and the other, the Gueqdon, at L'Orient. The vessels will each be of 9,516 tons displacement, and are to be fitted with three sets of triple-expansion engines to be collectively equal to driving them at 21 knots. The vessel to be built at Toulon will be 453 feet in length, 64 feet beam, and with a draft of 23 feet will displace 9,500 tons. The aggregate indicated horse power of three sets of engines is to equal 19,000, and the boilers are to be fitted for burning coal or oil as fuel, the 1,600 tons of fuel which she will carry giving her a radius of action of 6,500 miles at 10 knots.

Suitable Places for Compasses.

Long experience gained by watching closely the results of adjustment of compasses in hundreds of ships from the time they were launched, and in every latitude, until they rested finally in "rotten row," points to one cardinal result—that no arrangement of correctors yet given to the public modifies the necessity for the greatest care in providing suitable places for the standard and other compasses generally used in the navigation of the ship. From the neighborhood of these positions all iron or steel fittings should be excluded, and brass or wood substituted when structural considerations adverse to this are not imperative. Sometimes iron fittings may be utilized as correctors, but the cases are rare. It may be argued that if, by properly providing places for the compasses when a ship is designed, the serious difficulties that present themselves in war vessels can be successfully overcome, it is not too much to ask that the owners and designers of vessels of the mercantile navy should face the far easier problem connected with the placing of compasses in the ships with which they have to deal. Happily, under the intelligent control of our great shipping companies, the question of placing compasses is generally well looked to. But even in some of these, the chart house, which might be made of wood, is made of steel, with the principal steering compass therein only a very short distance from the steel bulkhead. Permanent diminution of directive force on the compass is the consequence.—Nautical Magazine.

A Pleasant Month.

October on the lakes is a month of transition from warm to cold—generally one of the most pleasant of the year. The change to winter conditions is first noticeable on Lake Superior, where light snowstorms may occur at any time after the 15th. Snow falls in the vicinity of Marquette a little earlier than at other points to the westward. It has been observed as early as Sept. 13 both at Marquette and Sault Ste. Marie. On lower Lake Michigan snow has fallen as early as Oct. 6, but the average date of first snow is about a month later. The average date of first snow at the eastern end of Lake Erie, viz.: Oct. 28, is about ten days earlier than at the western end. The average date of the first freezing temperature falls a little earlier than the average date of first snow, viz.: Duluth, 13th; Marquette, 11th; Milwaukee, 19th; Grand Haven, 17th; Alpena, 5th; Detroit, 20th; Chicago, 26th; Cleveland, 27th; Buffalo, 24th; Oswego, 25th.—Weather Bureau Chart.

Major W. L. Marshall, United States engineer at Chicago, opened bids on the 23d inst. for constructing eight miles of the eastern section of the Illinois and Mississippi canal—miles 17 to 24—excavating lock pits and constructing foundations for three locks, and for constructing one concrete arch culvert. The sum of the lowest bids on the several different parts of the work is $233,433.80. There were sixteen bidders, and on some of the earthen work the price was down to 8 cents per cubic yard. The list of successful bidders includes Cogan & Pound, Heldmaier & New, R. C. Cushing & Co., and H. A. Boedeker & Co., of Chicago; John J. McCoughey of Summit, Ill., and the Globe Construction Co. of Cincinnati.

The Marine Review has prepared in neat oak frames cards containing the schedule of time required to be run between certain points in the St. Mary's river under the speed limit of seven miles an hour. When hung in a pilot house, distance and time may be readily noted from these cards, as the type is large. They will be sent by express to any address at $1 each, or may be had upon application at 409 Perry-Payne building, Cleveland, for 65 cents each.

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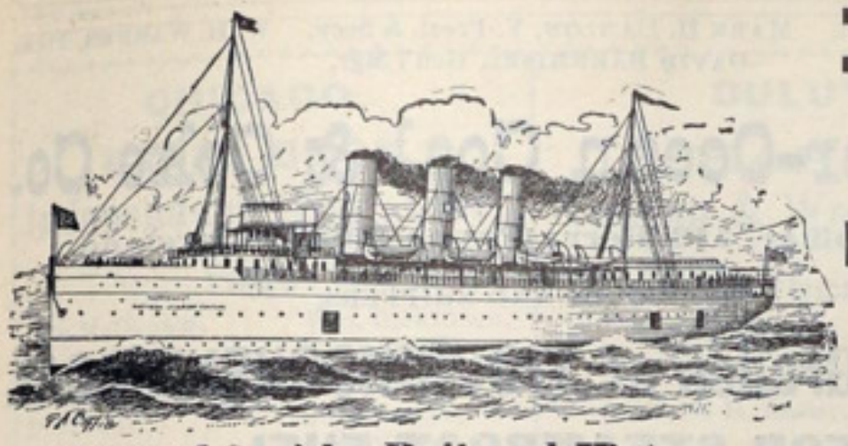

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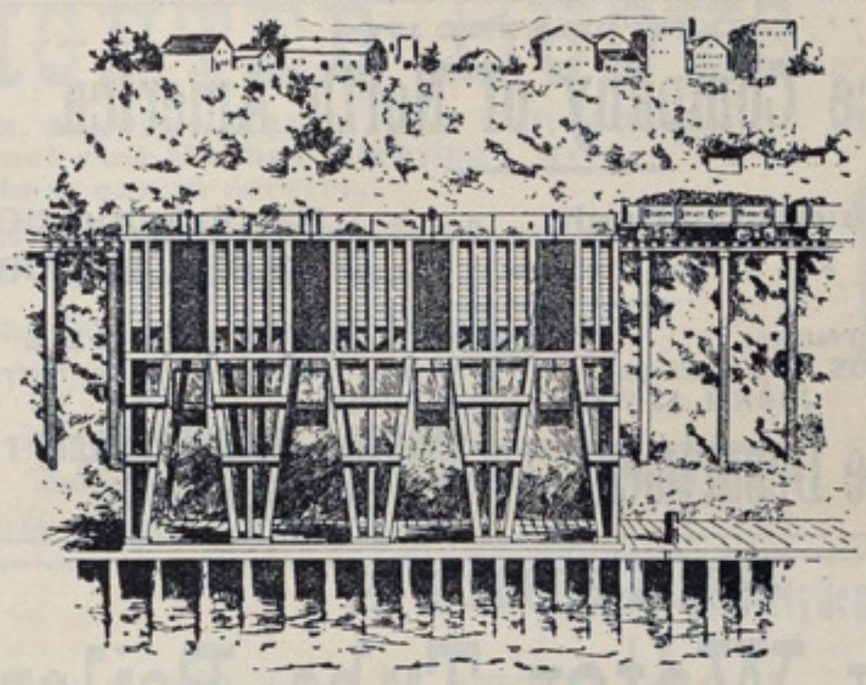

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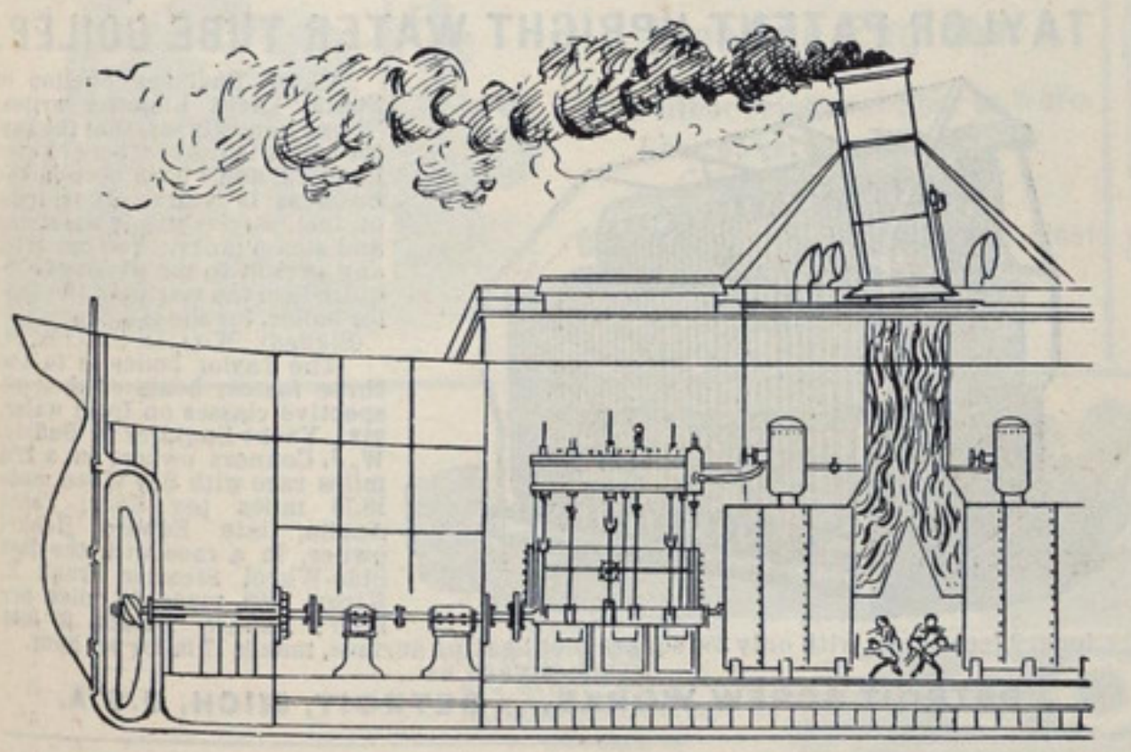

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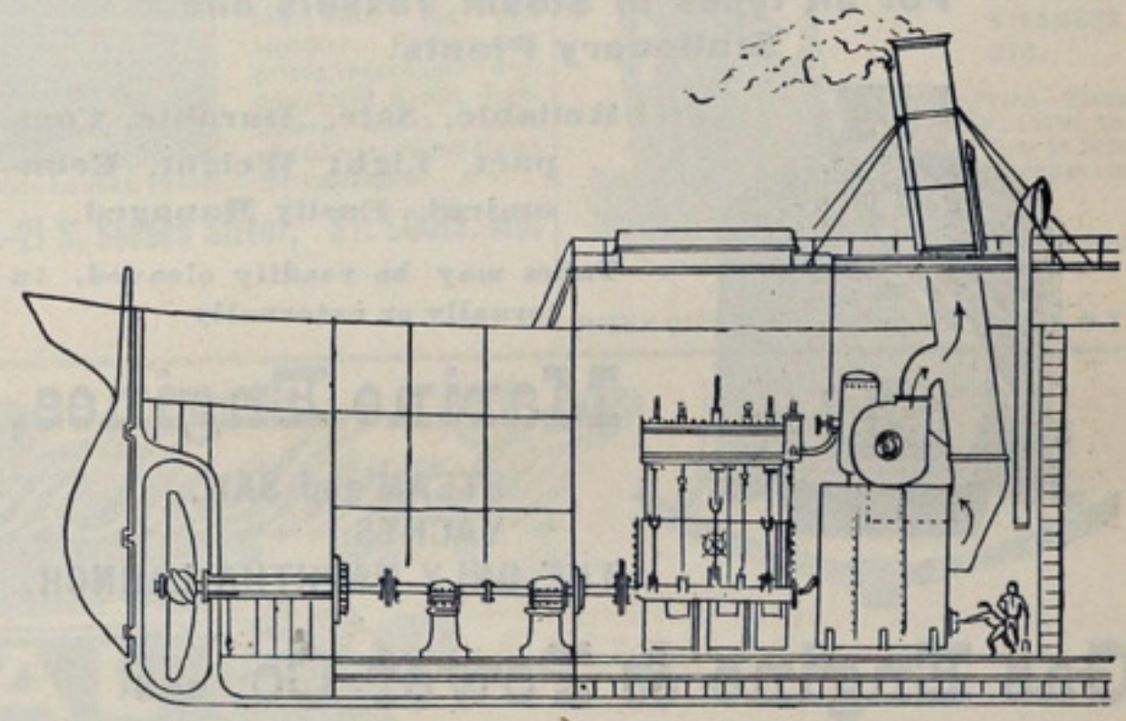

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From LORAIN, OHIO, August 2, 1896, From TWO HARBORS, WIS.,.....1896,
To SUPERIOR, WIS.....1896. To CLEVELAND, OHIO, August 13, 1896.

Corresponding Amounts, Provided this Steamer had been Equipped with Ellis & Eaves Draft and Serve Ribbed Tubes.

ENGINEER'S DEPT.										% Saving.
Fuel, 165 tons	$348	67				$261	46			25
Oils	15	14				15	14			
Repairs	1	00				1	00			
Supplies	11	66	$376	47		11	66			
STEWARD'S DEPT.								289	26	
Provisions	119	20								
Supplies	3	37	122	57				122	57	
Handling Cargoes (unloading)	364	40								
Hull Repairs	20	25								
Towing	12	00								
Chandlery	1	38								
Sundry	13	15	411	18				411	18	
WAGES—ELEVEN DAYS.										
Captain.....$175.00 per mo.	64	16				64	16			
Mate 80.00	29	33				29	33			
2d Mate 56.00	20	54				20	54			
2 Wheelmen 34.00 (12.46)	24	92				24	92			
2 Lookouts 34.00 (12.46)	24	92				24	92			
1st Engineer 112.50	41	25				41	25			
2d Engineer 80.00	29	33				29	33			
2 Greasers 34.00 (12.46)	24	92				24	92			
3 FIREMEN 34.00 (12.46)	37	38				37	38			33⅓
4 Deck-hands 17 00 (6.23)	24	92				24	92			
1st Cook 60.00	22	00				22	00			
2d Cook 17.00	6	23	349	90		6	23	349	90	
Total Expenditures			1260	06				1172	91	

Up Cargo, 2453 (1900) net tons.
Down " 2265 gross "

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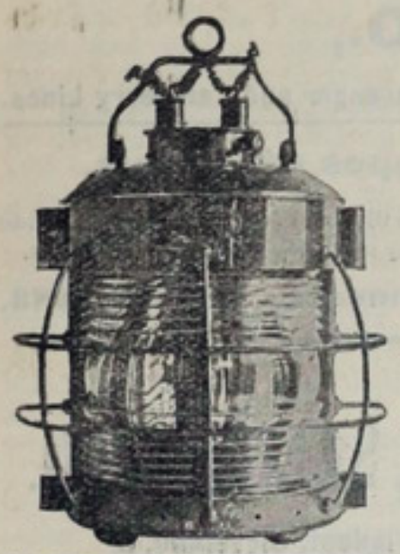

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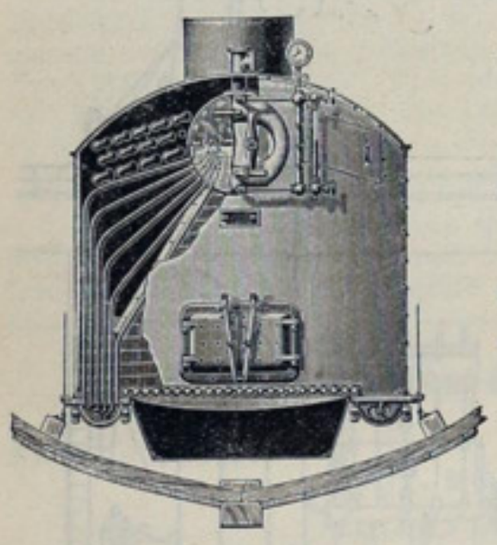

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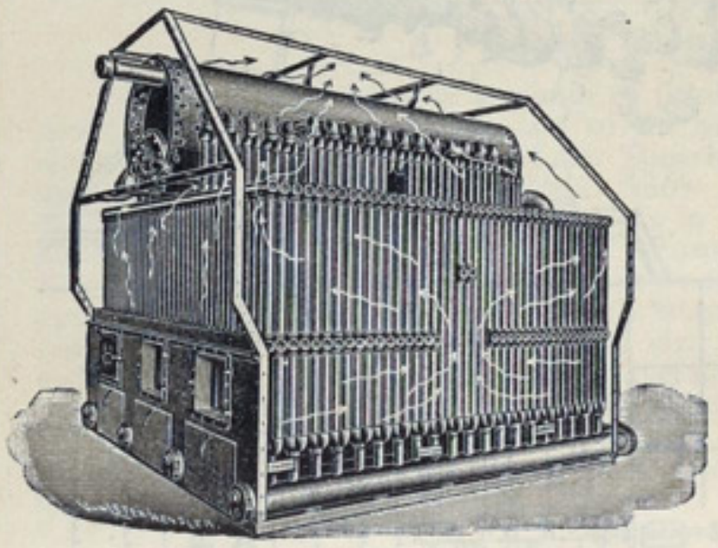

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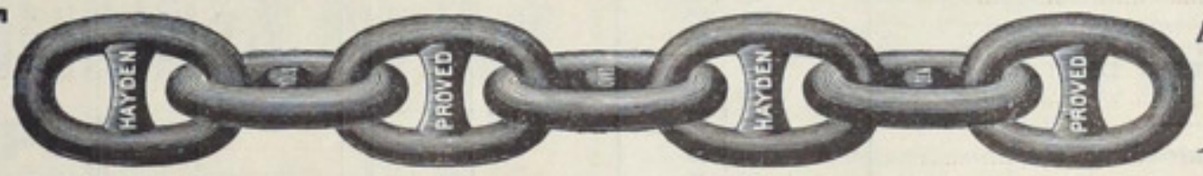

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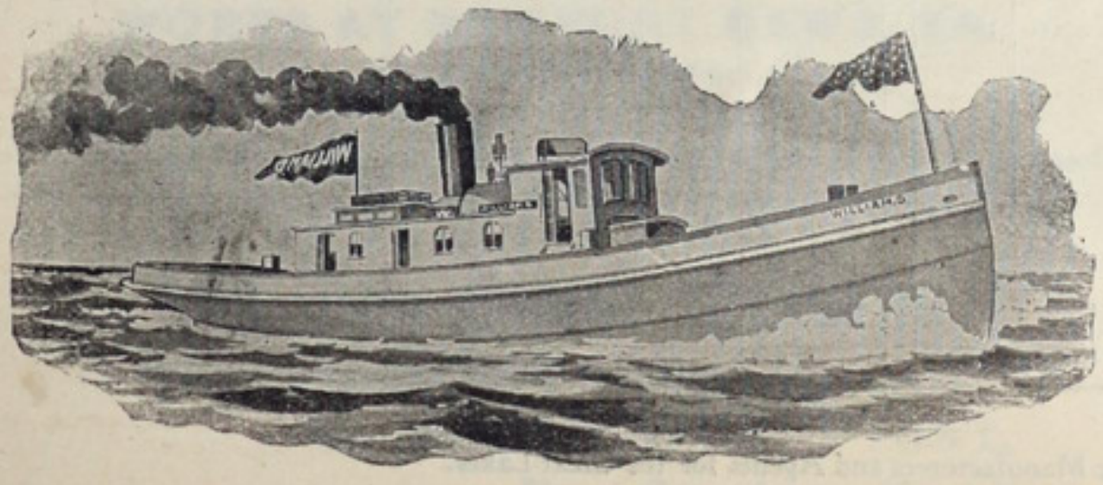

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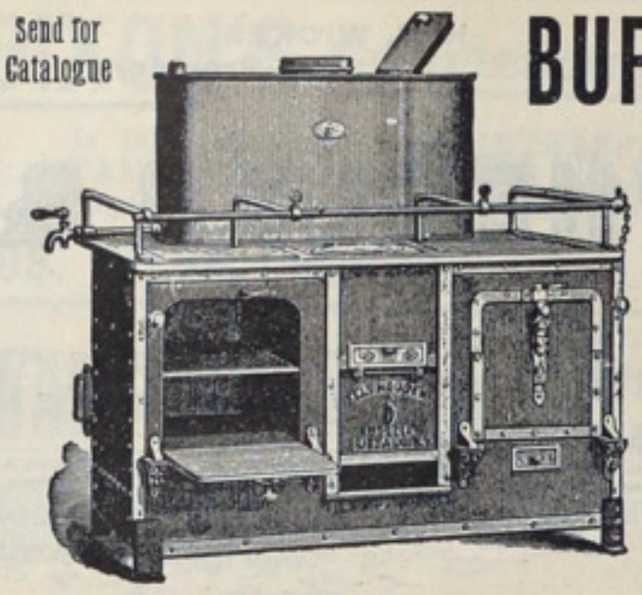

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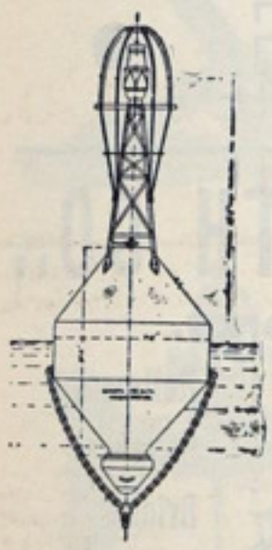

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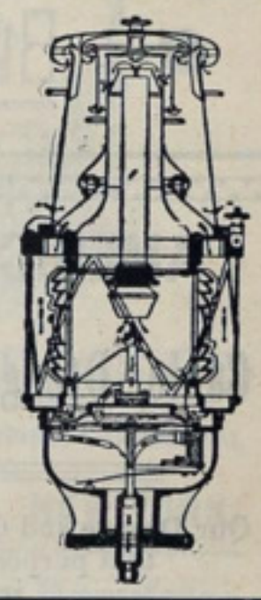

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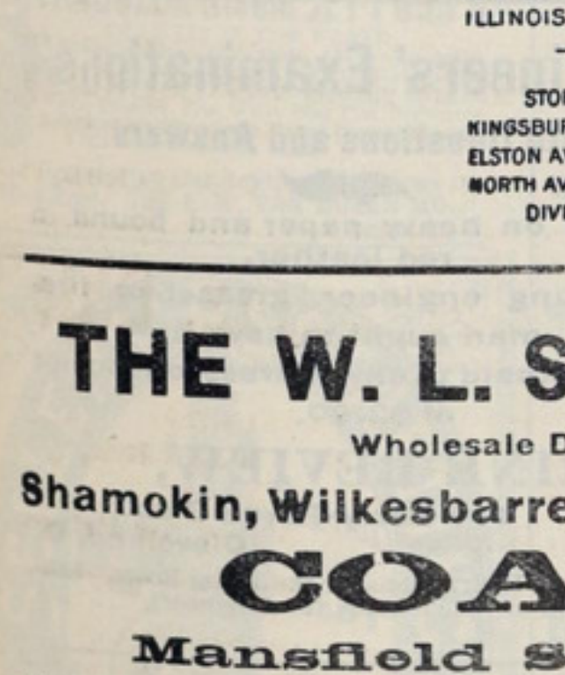

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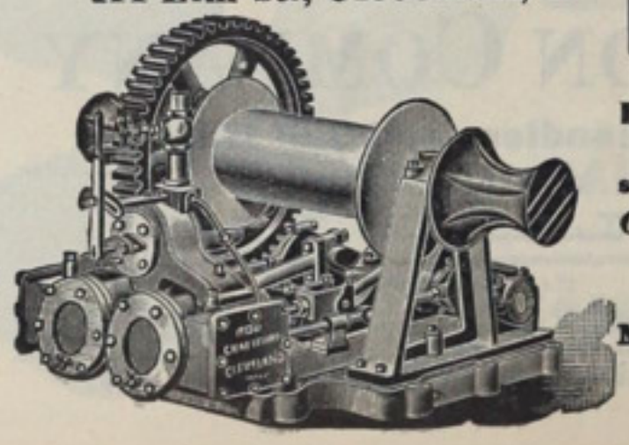

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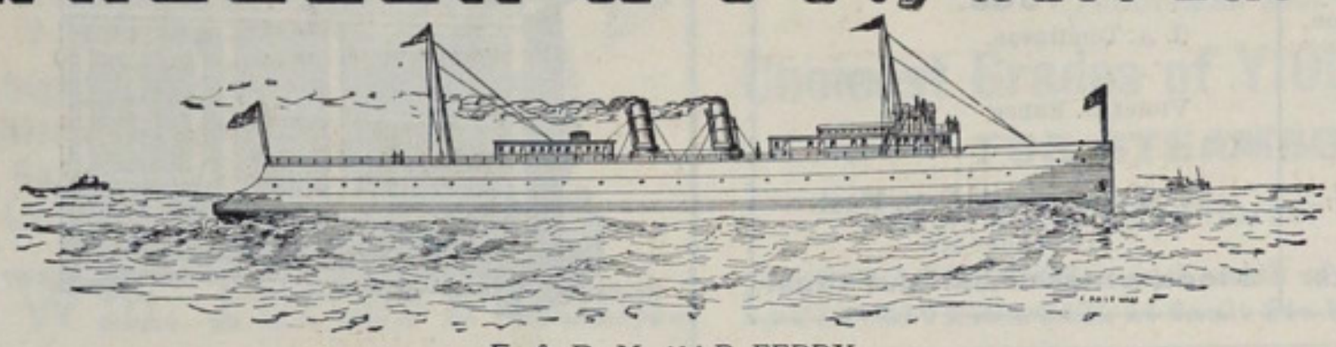

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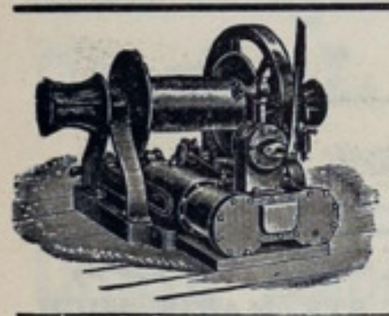

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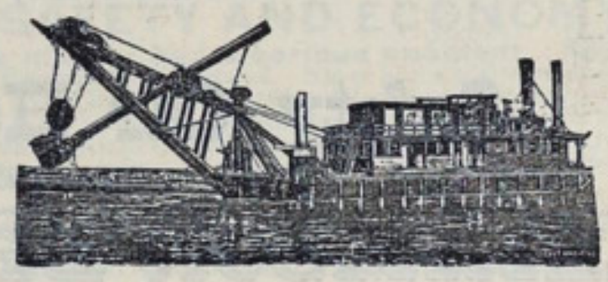

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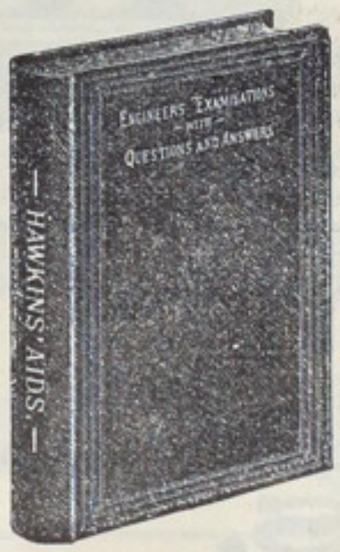

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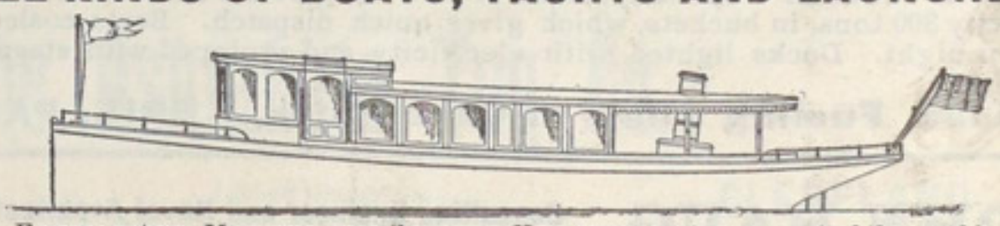

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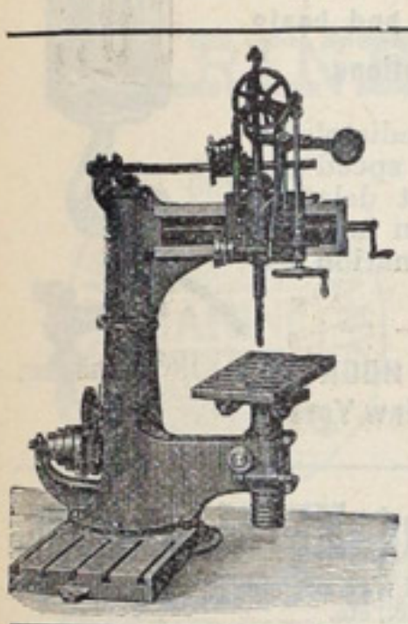

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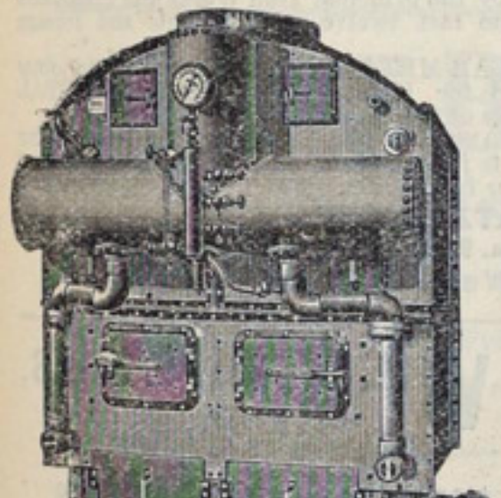

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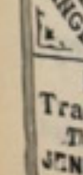

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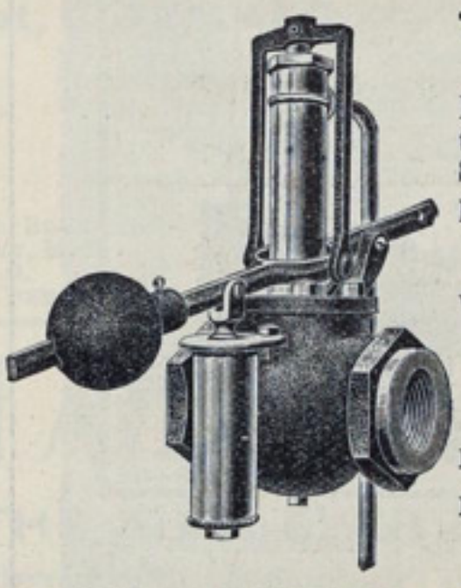

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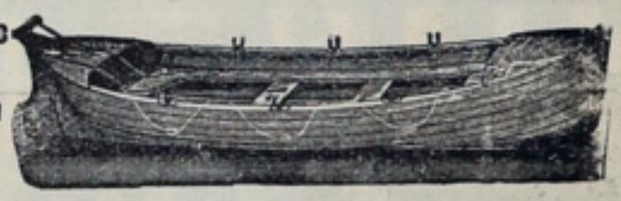

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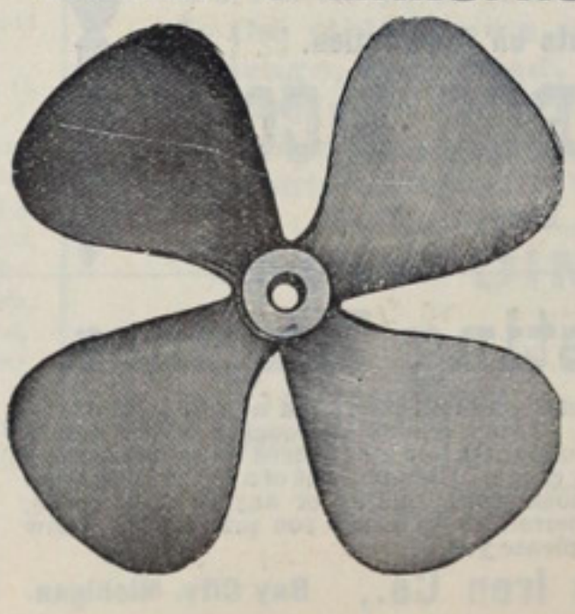

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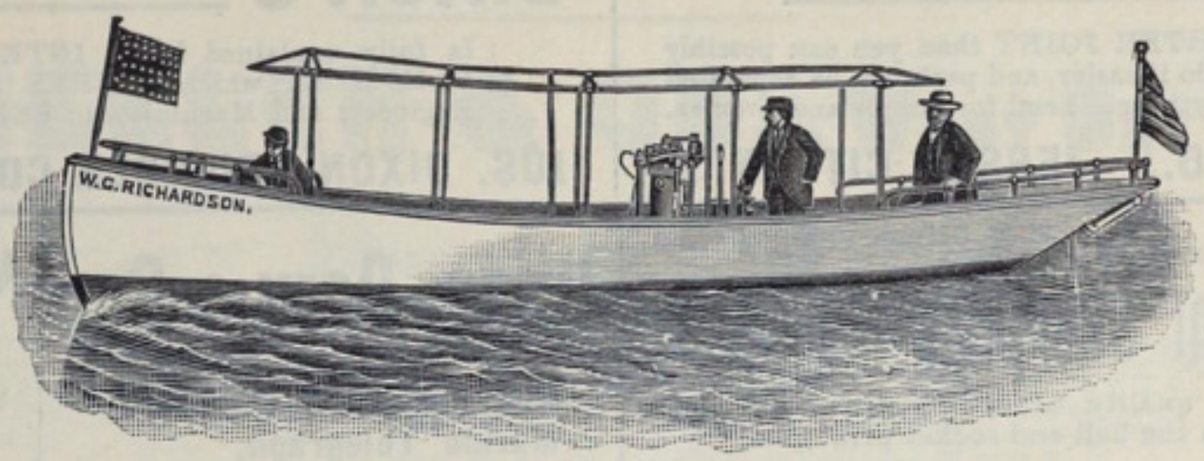

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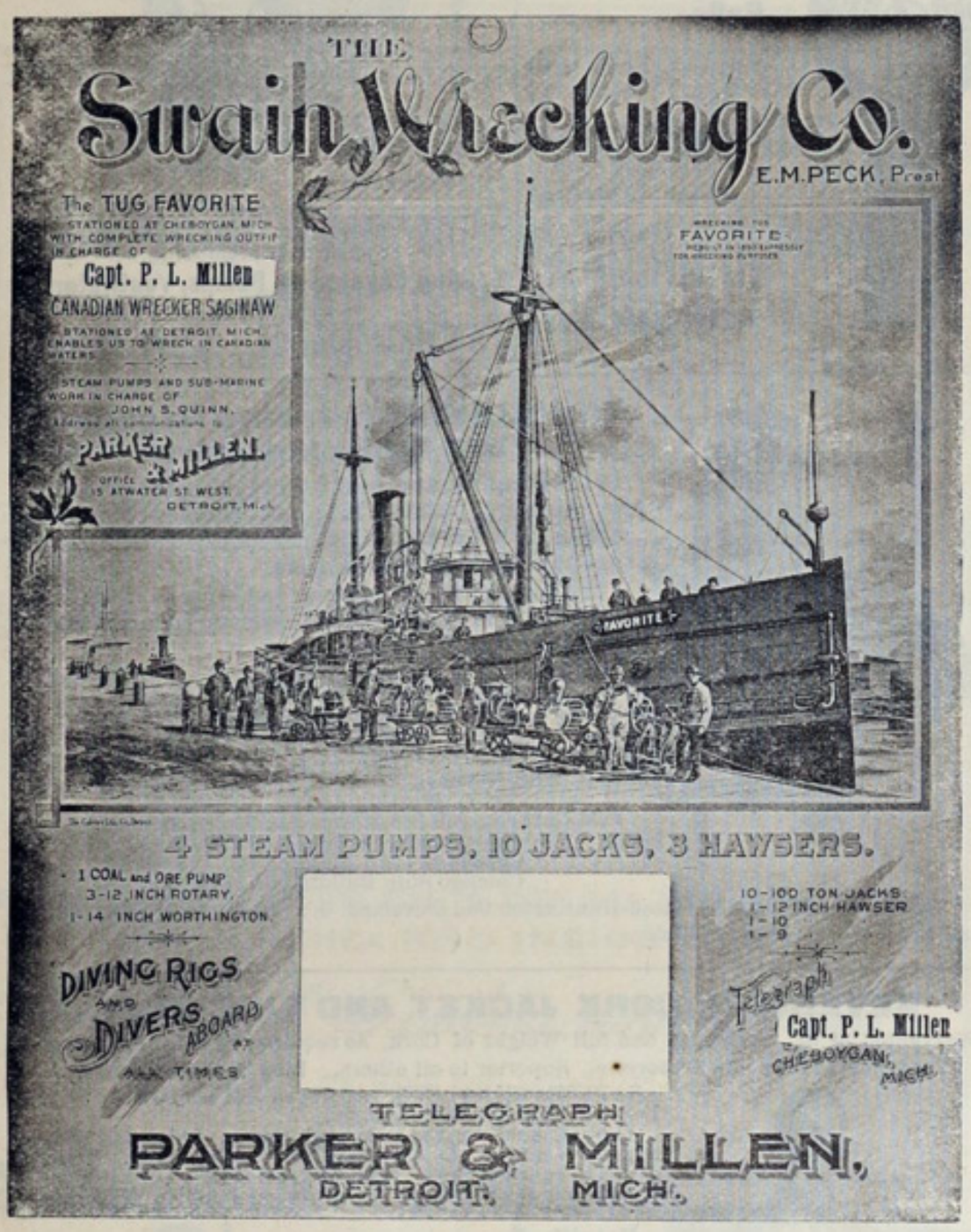

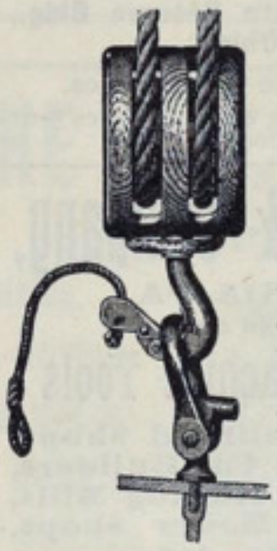

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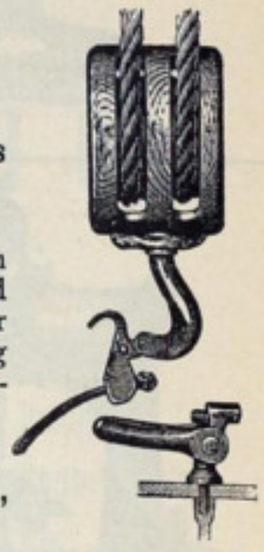

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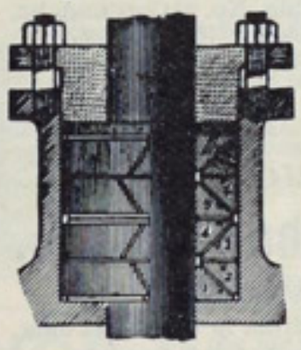

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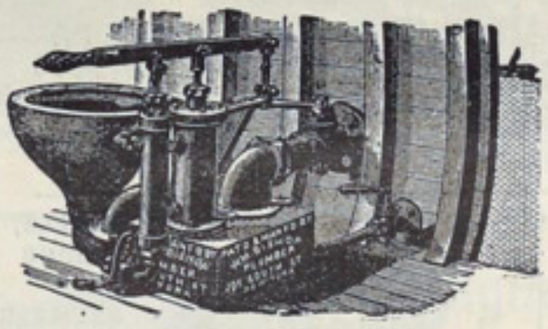

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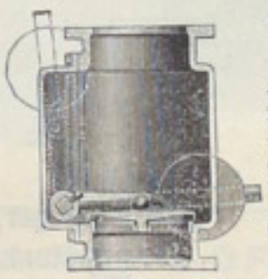

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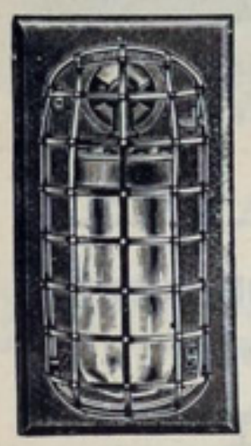

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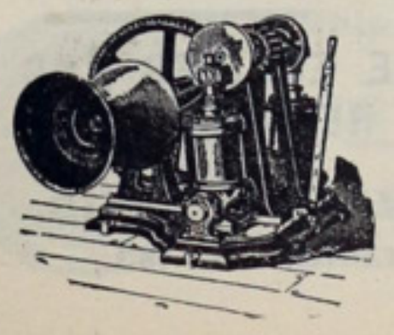

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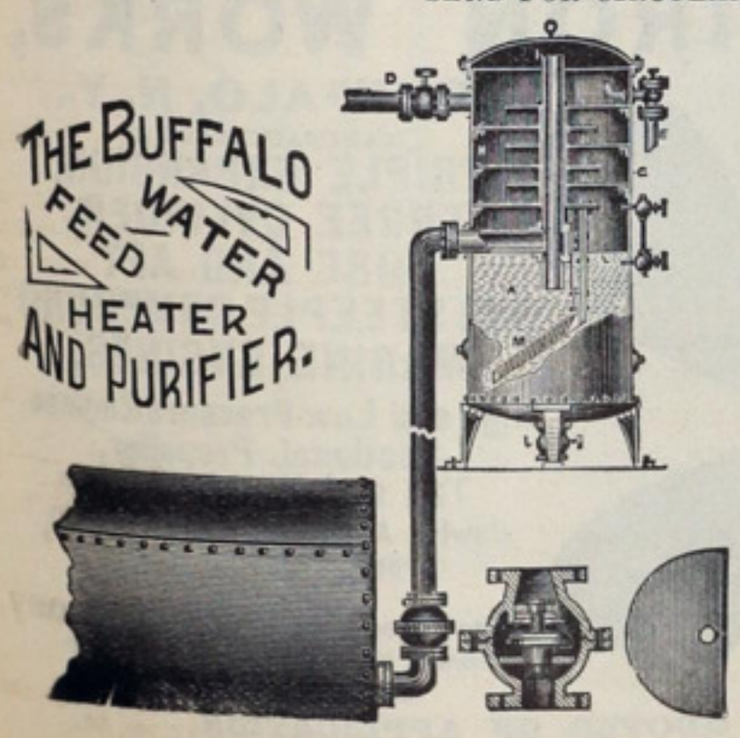

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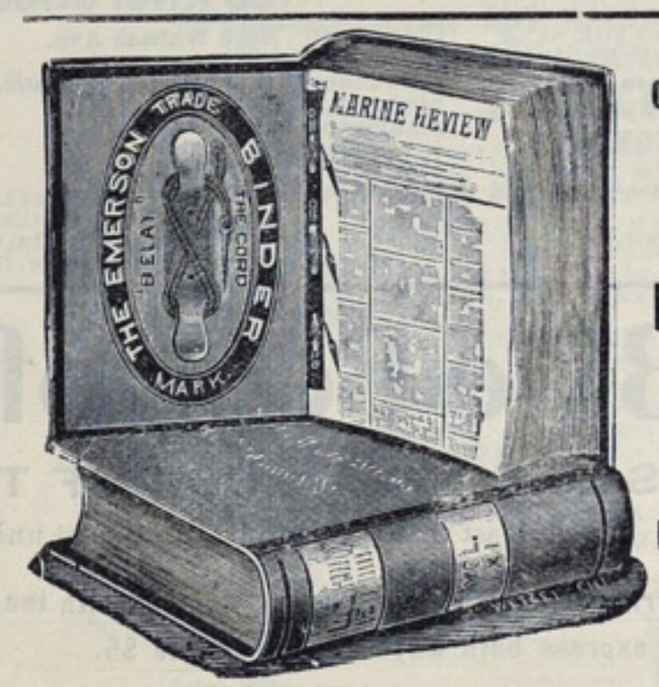

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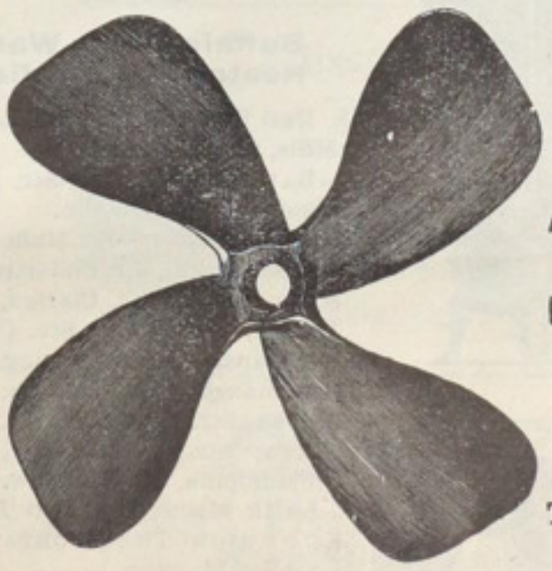

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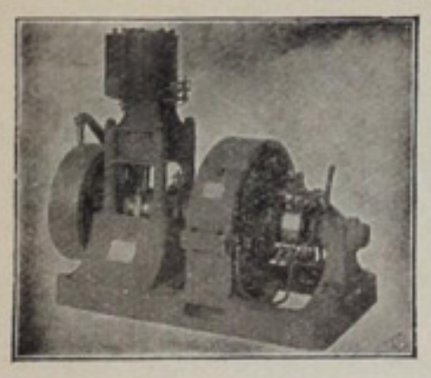

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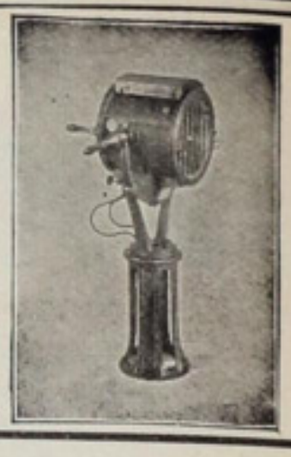

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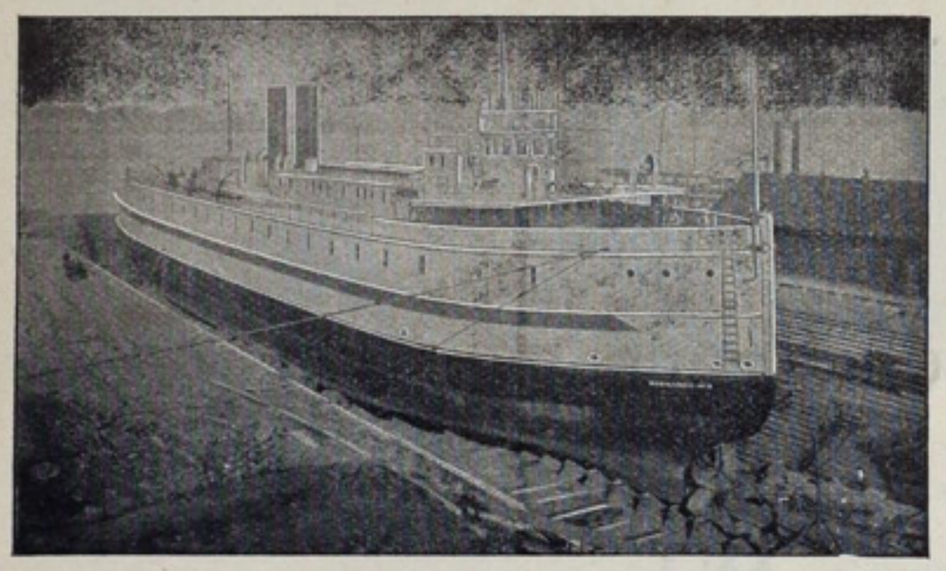

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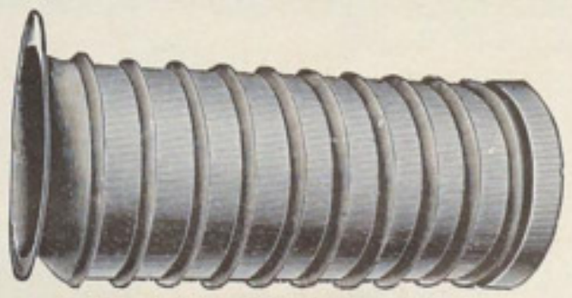

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With this style of Furnace Flue, the rivets at the "back end" are out of the line of fire, and all that has to be done to remove it is to cut out the rivets at the ends and slip it through the front; and to replace it, simply to slip it back in its place and rivet up the ends again without disturbing any other part of the boiler. No smith work is required to fit it in a boiler or to refit it when replaced. It is ready for use as it comes from the manufacturers. This style of Flue has been in use six years without a single complaint.

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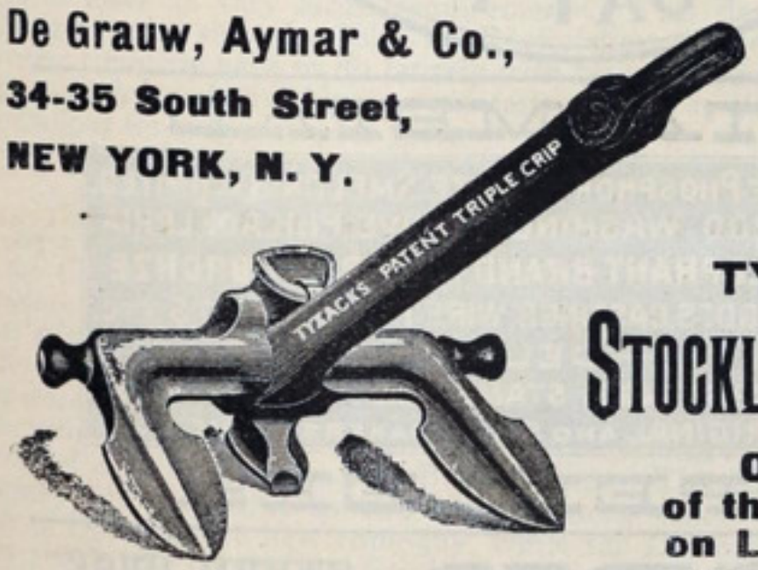

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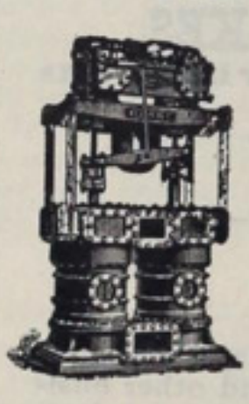

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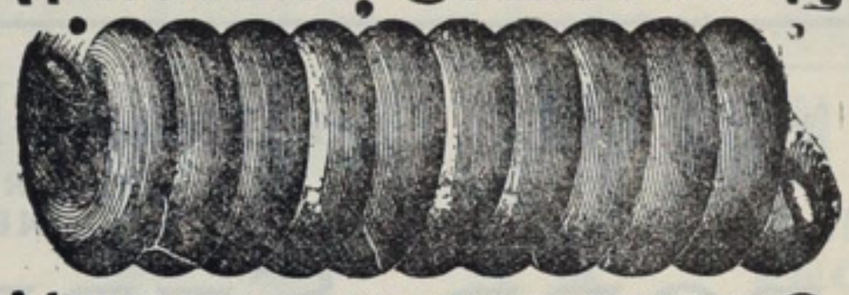

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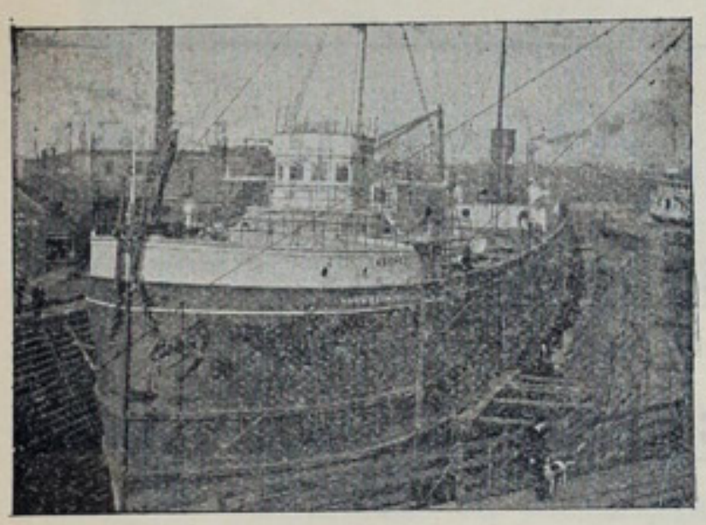

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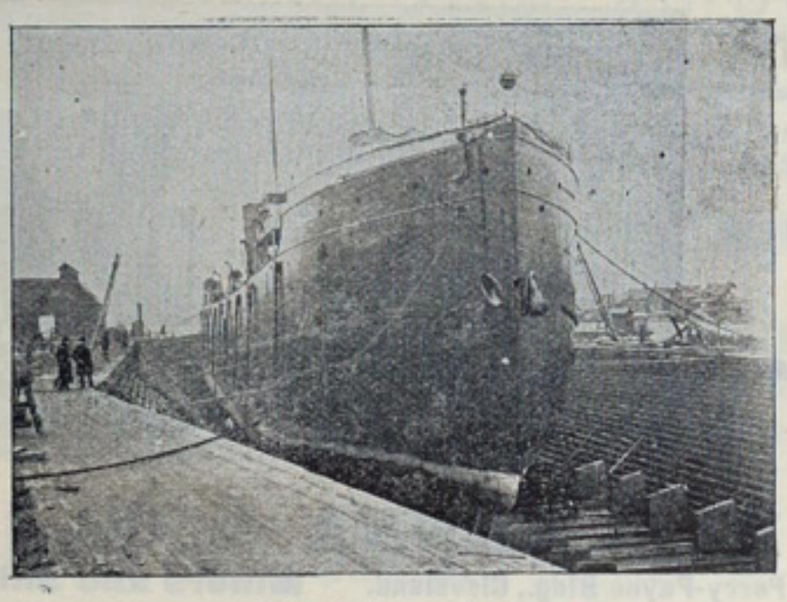

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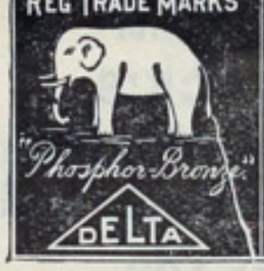

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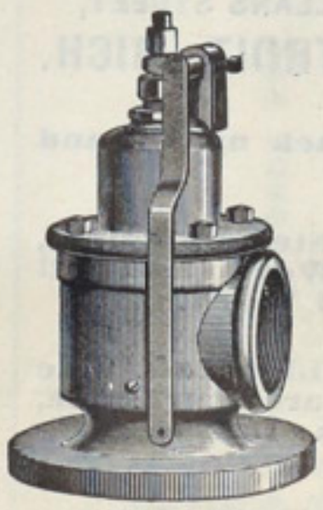

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